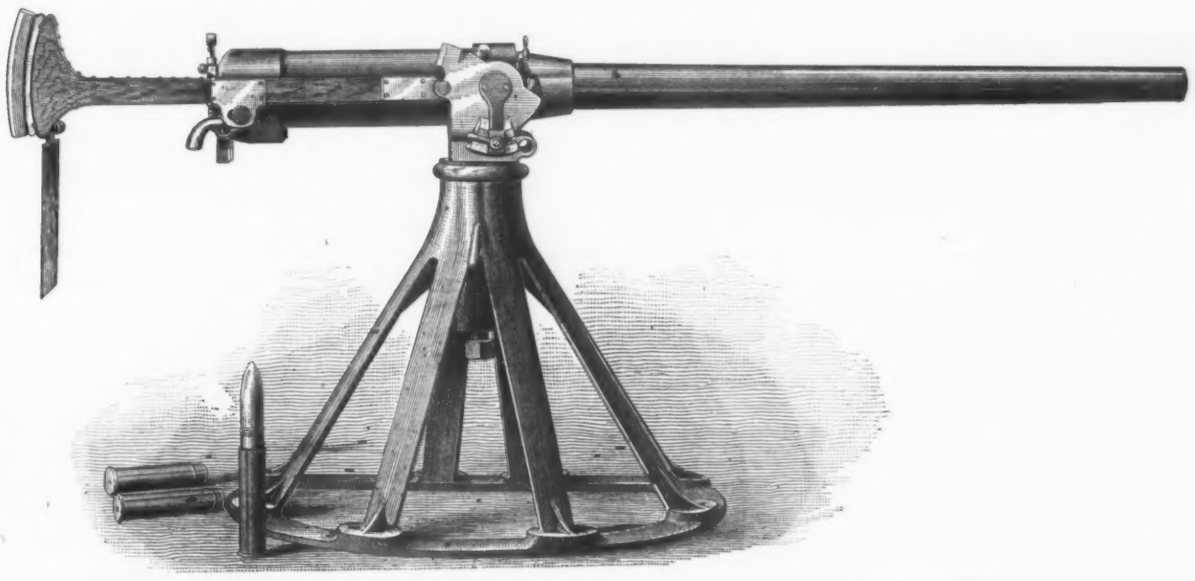
THE IRON AGE

THURSDAY, FEBRUARY 5, 1891.

How Rapid-Fire Guns Are Made.

THE DRIGGS-SCHROEDER GUN.

In our issue of January 16, 1890, we described and very fully illustrated the Driggs-Schroeder rapid-fire gun. One of these guns was recently finished, tested and accepted, this being the first one of 56 now being built for the United States Government. It was a 6 pounder, weighed 848 pounds, had a range of 5 miles and used a hardened steel projectile. It will be remembered that the Driggs-Schroeder gun has the rapidity of fire of the Gatling gun, while it is so nicely balanced on its pedestal that a touch of the finger will serve to move it in any direction. Since our description was published a few minor changes have been made in the design, but the gun as a whole remains as then planned. These guns are being built by the Colt's Patent Fire-Arms Company of Hartford, Conn., under a contract with the Driggs Ordnance Company of Washington, D. C. The present plant is equipped to turn out 1, 3 and 6 pounders.



SIX-POUNDER DRIGGS-SCHROEDER RAPID-FIRE GUN.

It is proposed in the following article to describe the method pursued in the manufacture of these guns, taking the material as it is received from the steel works, and following it through the succession of operations until we find it in the assembled gun.

THE TUBE FORGINGS.

Fig. 2 represents the tube in the condition it is received from the Bethlehem Iron Works, the dimensions on the drawing showing the present and final size of the tube. It has a total length of 104 inches, and diameter at the breech of 5.8 inches outside, 3.85 inches at the muzzle, the bore being 1.8 inches. Metal enough is to be removed from the interior and exterior of the tube to make the outside diameter at the breech 5.5 inches and 3.54 inches at the muzzle, and the bore 2.244 inches.

STEEL SPECIFICATIONS.

The tube is made of open-hearth steel, as are also the other principal parts of the gun. The tensile strength must not be less than 85,000 pounds, nor the elastic limit less than 42,000 pounds, both for the tube and its jacket. These figures, it will be observed, represent the minimum allowed, and it may be stated that all the steel so far received has been much in advance of this. In making the test the average of two test pieces from each part must not be less than 90,000 pounds tensile strength, and 45,000 pounds elastic limit. The tensile strength of the metal of the breech block must not be less than 130,000 pounds, nor the elastic limit less than 75,000 pounds. Metal for the 3-pounder tube and jacket received from Bethlehem has had a tensile strength of 118,000 pounds and an elastic limit of 70,000 pounds, these figures not representing exceptional cases, but showing the average quality of the metal employed. Before leaving the Bethlehem works the tubes are rough turned and then oil tempered, in which condition they are delivered to the manufacturers.

WORK ON THE TUBE.

The several steps into which work on the tube may be divided are as follows: First, it is forged solid, then bored, then rough turned, oil tempered, annealed and then delivered. At the works it is bored and turned, then given a finishing bore, then a finishing turn for shrinking, after which the jacket is put on, and it is lapped, rifled, tested and browned.

When first received it is rough-turned to break up the surface temper, after which a roughing reamer is put through. This reamer is four-fluted, each ridge forming a cutting edge, and is carried at the end of a bar having a wide V-shaped groove and a longitudinal oil hole extending its entire length. The oil forced through this hole by a pump at one end of the machine flows back to the pump through the bed. The reaming cutter has a length of 12 inches and is cylindrical. This makes the diameter of the bore 2 inches. Another and larger cutter of the same character is then put through, bringing the diameter to 2.2 inches. The final cutter brings the diameter to 2.244 inches. Between each operation on the bore the tube is turned in order to make sure that the bore and surface may constantly remain perfectly concentric. For turning it is mounted in the centers of the lathe and worked in the usual way.

JACKET.

Work at the same time has been going on on the jacket, which is shown in Fig. 3. The rough forging is given two borings, and is then mounted on a mandrel and turned down to within 0.005 of its final size. It is then sent to the planer, and the outside of the breech planed to dimensions, after which it is returned to the lathe and the bore brought to the finished size. The jacket is then taken to a

VERTICAL UNIVERSAL MILLING MACHINE AND PROFILER,

designed by F. S. Smith, the foreman in charge of the Driggs-Schroeder gun work. An idea of the work yet to be done on the breech end of the jacket may be had from the drawing, Fig. 4, which we reproduce from our former article for this purpose. The jacket is placed in an upright position in a holder, which has a vertical feed up and down either by power or hand. The main spindle, carrying at its lower extremity the milling tool, has a movement in either direction sidewise and either forward or back. The speed is changed on the counter. An auxiliary spindle placed parallel and in front of the main spindle is driven from the latter by gearing, and is used for smaller work. In this machine the breech end of the jacket is milled out to the forms shown in Figs. 3 and 4 and grooved to receive the bands of the breech block.

STAR GAUGING.

During the final operations of boring both the tube and jacket, the star gauge

is frequently employed to ascertain the exact diameters. This gauge consists of a jointed rod, in one end of which are two fixed and rigid points placed in line diametrically. At right angles to these two points are two others which may be moved toward or from the axis of the rod by means of a tapered piece moving between them and forcing them outward. This tapered piece is secured to the end of a small rod passing through the larger one to the rear end, where it is provided with a sleeve encircling the tube. The inclination of the sides of the taper or wedge shaped piece is such that a forward movement of the inner rod of 1 inch will advance the star points 0.1 inch. A scale on the sleeve is so graduated as to permit the reading between the star points to within 0.0004 inch. This gauge is placed in the bore at the breech end and every 2 inches of the bore measured. No error in excess of 0.002 inch is ever allowed, and there must be nothing under. In other words, the bore must at all points be at least 2.244 inches in diameter, and must never exceed this more than 0.002 inch.

SHRINKING ON THE JACKET.

The tube is now carried to another department where the sleeve shown in place at A, Fig. 5, and detached in Fig. 6, is shrunk on. In this operation the tube is held breech up.

This gives a shoulder for the jacket to strike against. The allowance for shrinkage varies with the elastic limit of the metal both in the tube and in the jacket. In other words, the exterior diameter of the breech of the tube and the bore of the jacket varies according to the elastic limit of the metal they are composed of. Tables have been calculated giving the shrinkage to be allowed for in metals of different strengths, so that a simple reference to these tables will give the workmen all the information necessary in regard to boring and turning the jacket and tube. To convey more clearly an idea of the work done by this table, we take the following figures at random as applied to the 6-pounder gun. The metal of the tube having an elastic limit of 45,000 pounds, and that of the jacket 39,128 pounds, the shrinkage would then be 0.0093.

Again, if the figures for the tube were 65,000 and for the jacket 54,412, the shrinkage would be 0.0107. The shrinkages are in inches and applied to the diameters, and a tolerance of minus 0.002 is allowed in manufacture. In practice the shrinkage runs from 0.0062 to 0.0128.

The jacket is mounted breech end down in the center of 16 vertical pipes arranged in a circle. Each of these carries six Bunsen burners, which project toward the center of the circle. Suspended over the jacket is the tube. It is held from a hook on a block through which runs a wire rope leading to a windlass placed near it, and which may be thrown out of gear in order to permit the tube when the time comes to run down freely. The jacket is heated to about 450°, thermometers serving to indicate the temperature, and a kind of star gauge being employed to ascertain when the expansion of the jacket has reached such a point as to freely admit the tube. At the proper time the tube is dropped into the jacket, and a crosshead fitting the tube and bearing against the sleeve A, which is already in place, is brought down and fitted over stationary vertical screws, upon which nuts are applied, in order to bring the tube to its proper position in the jacket and to hold it in place. After the jacket has thus been secured in place cold water is poured on it at its outer end or next the sleeve, so as to nip it at that point first. A continuous circulation of cold water is sent through the tube while the jacket is cooling.

The shrinkage of the jacket on the tube compresses the latter from 0.001 to 0.0026, and it is next necessary to remove this reduction in the diameter of the bore of the tube at the breech.

LAPPING.

The gun is then taken to the lapping machine, which very much resembles a long lathe. The headstock carries a long bar, provided at its outer end with a cylindrical wooden extension, upon which a strip of emery cloth is wound. The gun is mounted with its breech toward the headstock on a saddle moving to and fro on the bed. At first course emery cloth and oil are used to increase the diameter and then fine emery to polish the bore. During this final operation the star gauge is frequently used and with extreme care. The final test for both size and straightness of bore is the passing of a 12-inch hardened cylindrical steel plug through the bore, this plug being the exact diameter required in the finished bore, or 2.244 inches. Preceding this long plug, a short one of the same diameter is tried, mainly as a precaution to prevent the liability of the first one sticking. Before lapping, the thread for the trunnion band, which is shown at B in Fig. 5 and detached in Fig 7, is cut partly on the jacket and partly on the sleeve, as indicated in Fig. 5, and the band screwed on to lock the component parts.

RIFLING.

The rifling machine differs very little from those ordinarily used. It consists of a long bed, over twice the length of the gun to be rifled, and resembling in every respect the bed of a lathe. The gun is mounted with the breech toward the head of the machine. The cutter bar is carried by a sliding crosshead, which is constrained to follow the rifling groove which rests over the center of the bed at the head end, and the curvature of which is such that the rifling at the breech is one turn in 150 calibers and at the muzzle one turn in 27 calibers, being, therefore, what is known as the increasing twist. This curve is technically called a semi-conical parabola, and was adopted as it has been found to present the least strain on the rifling and to subject the gun during firing to less torsional strain than any other curve. Twenty-four grooves and 24 lands constitute the rifling, these being shown in Fig. 8. The diameter at the lands is, of course, that of the finished bore, 2.244 inches, the diameter at the grooves being 2.268 inches. During rifling the gauge is frequently applied. At the tail end of the machine is a pump, from which leads a brass tube, in which slides telescopically a

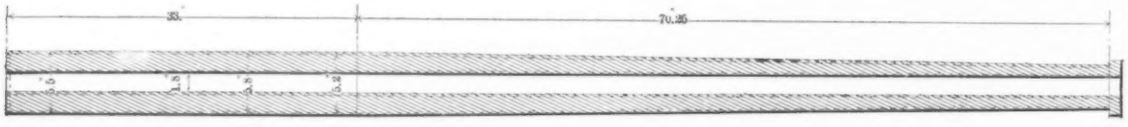


Fig. 2.—The Tube.—Rough Forging.

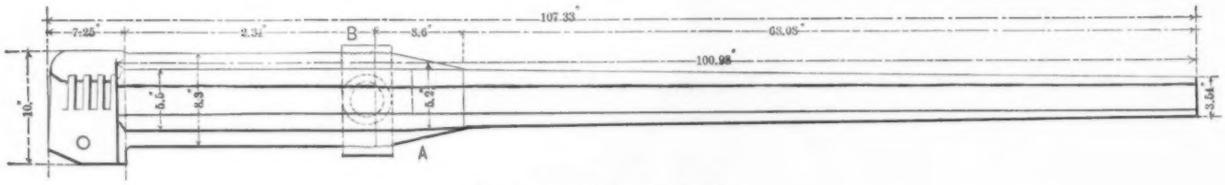


Fig. 5.—The Tube Completed.

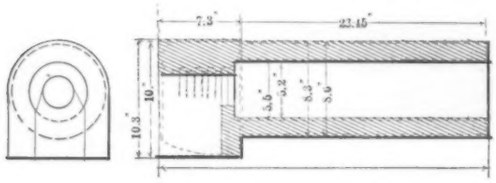


Fig. 3.—The Jacket.

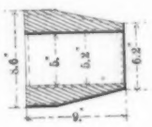


Fig. 6.—The Sleeve.

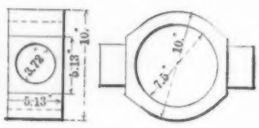


Fig. 7.—Trunnion Band.

SIX-POUNDER DRIGGS-SCHROEDER RAPID-FIRE GUN.

second tube connected with the crosshead and with a groove through the cutting bar. Oil is always thus forced to the cutter. At each stroke of the machine the cutter is advanced automatically by means of a taper plug, which strikes against a tappet arm operating an index, which may be set so as to automatically stop the cutting when the required depth has been reached. Spacing is done by the index or by hand. An idea of the quality of the metal entering into the gun and of the all parts worked as easily as when first assembled.

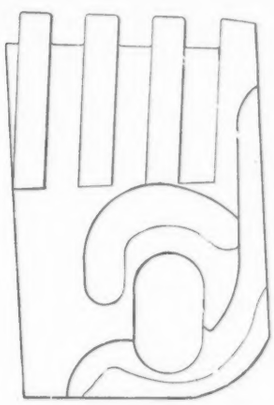


Fig. 10.—*Side View of Breech Block.*

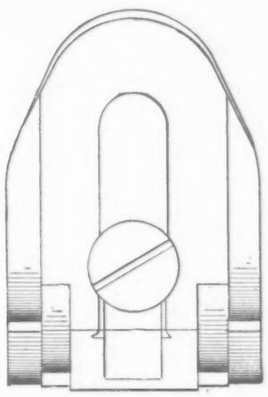


Fig. 11.—*End View of Breech Block.*

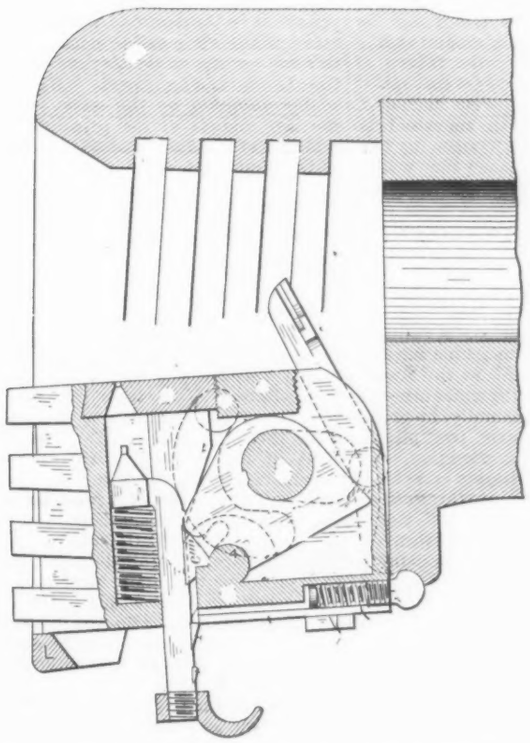


Fig. 4.—*Vertical Section, Showing Breech End of Gun.*

Fig. 9.—*The Breech Block.*

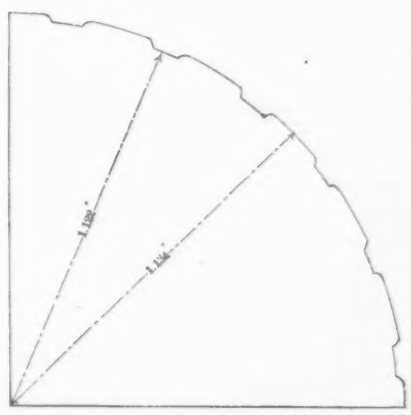


Fig. 8.—*Quarter Cross-Section of Bore, Showing Rifling.*

SIX-POUNDER DRIGGS-SCHROEDER RAPID-FIRE GUN.

perfection with which the machine does its work may be formed from the fact that single chips are frequently removed the full width of the groove and the entire length of the gun, somewhat over 100 inches.

THE BREECH BLOCK.

As received, the breech block has the form shown in Fig. 9, and after being finished it is as shown in Figs. 10 and 11, which we reproduce from our former article. The sides are first planed down, after which it is taken to a milling machine and a cutter with five gangs employed. The first is a roughing cut, while the next takes off all the metal except 0.004 inch, while the next brings it to size. The first cut follows a former and shapes the outer end for the outside of the bands. The final gang puts in the fillet. It is then bored for the firing pit and main spring, the main bolt slot made and the guide slot put in. Next the cam surfaces are made for operating the extractors, after which the inside is cut out to receive the main cam. Then the spaces are made for the face bolts and sear. All of these are milling operations.

The gun is now ready to receive the limb work, such as firing pin, main bolt, cam, face bolt, sear, main spring, &c.

TESTING.

The gun is now taken to the proving ground and a number of rounds of service charges fired. This is done in order to thoroughly try, as if in actual practice, the gun and its mechanism, and to see if it works as easily and truly after as before firing. The gun recently shipped was fired 12 times, and at the end of the test all parts worked as easily as when first assembled.

BROWNING.

After it is returned from the proving ground the gun is draw filed, and all oil and dirt carefully removed. It is then given a coat of acid, which is in reality a tincture of steel. This being allowed to dry, the gun is boiled in water for about 25 minutes, the action of the water setting the thin coat of oxide formed by the acid. It is then subjected to another coat of acid, then boiled, these operations being repeated four times. At the end of each boiling the entire surface is gone over with a scratch card, and it is then a dense black, having a brilliant luster.

We may add for the benefit of officers having these guns in charge that this surface may be maintained indefinitely if the scratch card only is used on the gun. The employment of emery cloth rapidly removes the oxide and brings to the surface unaffected steel upon which the atmosphere has a harmful effect.

At present, in addition to the 56 guns contracted for by the Government, the Driggs Ordnance Company are building one for the English Government. The United States Navy Department has secured the right to build on a royalty these guns of 4-inch caliber and above, and they are now building 75 guns, five of which have been finished. The army proposes to put in this system in their 3.2-inch field guns, and are now building one at Watervliet to test the system.

As might be expected, that feature which attracts most attention and excites the highest admiration is the extreme accuracy, not aimed at, but attained. At each stage gauges are frequently employed, and during the final operations the gauging is performed with appliances and with a carefulness unusual even in this age of excessive refinement in machine work. The result is a gun of the strongest possible description, capable of successfully withstanding the severest duty and yet preserving its high qualities.

THE EVOLUTION OF THE ELEVATOR.*

BY ROBERT M. SHERIDAN.

The business of building elevators is an "infant industry." Within the memory of those who are still engaged in its pursuit it had its birth. Our immediate ancestors walked up stairs and raised packages of freight to their lofts by means of a single sheave arrangement over which a hempen rope was laid, one end being fastened to the freight, the other to an ordinary winch. The year 1855 witnessed the first efforts to economize manual energy in this direction, by using steam as a direct agent to perform the work of raising and lowering a platform upon which freight was placed. The method of this application was complicated and very roundabout. The engine consumed steam to the equivalent of 20 horse-power of energy, and expended it in the lifting of less than one-third that power. By some freak of engineering, it was thought the proper thing to over counterweight the platform so that the counterpoise equalled the weight of the platform plus the fractional resistance of the load rising, and in excess of such requirements there was allowed about an additional one-fifth in weight to help the engine to raise the load. This caused the platform to rise in a way that must have given pride to the constructor, but it was a good thing in one direction only, because it necessitated the extra and purely unnecessary work of pulling the platform down.

There are still a number of these machines in more or less active service in the warehouses in New York and Boston, and occasionally one may be stumbled upon as far west as the Indiana line. During the period embraced in the years 1855 to the close of the war no material permanent improvements were made in hoisting engines of this class. In this, as in almost everything else, the parent necessity begot the child invention. The development of the older cities produced the need for higher buildings, and rapidly following such innovations the "evolution of the elevator" became more and more marked. Passing from change to change, improvements and blunders closely followed one another. The warehouseman and the merchant demanded more economical handling of the machines which had grown to become so essential to the proper conduct of their steadily increasing trade. About this time men found it convenient to be carried to their destinations, and were pleased with the conservation of energy made possible by the avoidance of long and tiresome stairways.

THE STEAM PASSENGER ELEVATOR.

It was about 1870 when the first regular steam passenger elevator was produced. It consisted of a double-reversing engine, with the cylinders oscillating, the piston rods driving a pulley from which a belt conveyed power to the axle. At the end of this a pinion intermeshed with a molded spur gear upon the periphery of a drum. Over this drum, in turned grooves, the cables were wound, conveying the motion to the car. The movement of this car was pulsatory, owing to the spur gearing. This was a great step forward, bounding at once with all the embryonic elements of success, except in the smoother running of the car. The last was easier of accomplishment. Now the same engine is used, excepting that the cylinders are stationary. The belt is dispensed with and the power communicated to the drum by the contact of a phosphor-bronze gear wheel, the teeth of which are cut to an Epicycloidal curve. This is drivan by a cut steel worm fixed upon the crank shaft, converting the reciprocating motion into a circular one. The drum is made of sufficiently large diameter to admit of considerable speed upon the car without increasing the engine's piston speed beyond an economical point.

HYDRAULIC ELEVATORS.

The development of this engine worked an important stage in the manufacture of passenger elevators. The first-named engine with the spur-geared combination is now the standard steam freight elevator. The last one is now being used with unvarying success both in economy of operation and smoothness of motion, and is the perfected steam passenger elevator, rivaling the hydraulic for large plants, and often excelling it in economy where only one elevator is required. I have outlined the development of the steam elevator engine up to its present condition. At various times during 20 years' experiments of many kinds tending toward the use of water as a power for elevator service have been made. It is only within the last ten years that success sufficient to justify the general introduction of the hydraulic elevator has been met with. The first decided step in this direction brought forth an elevator operated by the water pressure conveyed to the top of a piston placed vertically within its cylinder. Sheaves, around which the lifting cables were turned, were attached to the top of this piston, and by placing the cable around a similar sheave at the top of the building the falling of the piston distended the cables and raised the car to which they were anchored. Descending, the weight of the car raised the piston after the valve was opened to free the water resting upon it, and this water, passing through an opening at the cylinder's top, was conveyed by a small pipe placed parallel to it into the same cylinder at its bottom, thus forming a resisting force to prevent the piston's falling when the movement of the car was arrested.

Contemporaneous with this form of hydraulic engine the horizontal cylinder was developed. In this machine the cylinder is horizontally placed in the lowest part of the building, and the water pressure being taken where it is naturally the greatest, operates directly upon the piston, moving it in the forward direction. At the forward end of the piston a cross head carries the sheaves, and at the rear or closed end a cross head, anchored to the cylinder, carries a like number of sheaves. The cables, passing over these, beginning with the anchor upon the rear flange of the cylinder are distended by the water, forcing the piston forward. By this means the car is lifted. To lower it the water is allowed to pass out through the exhaust part of the valve, and when the car's descent is checked the piston is blocked by the solid body of water against it. The stroke of the piston varies with the car's travel, being proportioned 6 to 1, 8 to 1, 10 to 1 or 12 to 1, depending upon the various conditions affecting each particular case.

Without presenting drawings, it is not possible to give a tangible description of the valve movement, which renders it impossible to start and stop the car rapidly without producing undue strain upon the machine, or communicating an unpleasant and dangerous motion to the car. With the use of a stationary lever fixed in a panel within the moving car, the hydraulic passenger elevator of to-day gives a service adapted to the needs of the tower-like buildings which are to be found in the large cities. Without some such an arrangement it is not possible to supply the rapid and safe service which such buildings absolutely require. The valve of the old type in use upon hydraulic passenger elevators consisted of a plunger, which was operated by the direct pull of the rope within the car. This pull being communicated to the valve by means of a small pinion worked upon a rack permitted the full working pressure to be brought against the piston within the elevator cylinder. The starting of the car was thus made abrupt and unpleasant, and the stopping equally so. To overcome this serious objection was the object of several years' experiment. It remained for an outsider to discover and patent the vital principle of an auxiliary or pilot valve, which, being first operated upon by the motion given by the lever within the car, allowed the working pressure to gradually force the main piston, uncovering a series of graduated openings through which the water was admitted to the elevator cylinder. A Mr. Risdon of San Francisco, experimenting during the year 1882 upon a valve for controlling the operation of some machinery for the manufacture of sugar, first made use of the auxiliary valve in connection with the controlling of a main piston valve of the type mentioned. A somewhat similar pilot valve has been used for some time in the mechanism employed for the steam steering of vessels.

ACCIDENTS TO ELEVATORS.

The question of safety has played a very important part in the development of elevator machinery. In a properly designed machine all other features are subordinated to the desire to obtain absolute safety under all possible conditions. To this end various safety devices have been tested. Such experiments have resulted in the adoption by the more prominent elevator makers of the principle of the centrifugal governor attached to the car. This arrests the car's motion when it travels beyond a safe speed and has proved to be the best device for arresting the car in the hatchway in the event of the cables breaking. The most prolific source of accident to elevators has been caused by the car becoming ungovernable through the breaking of the operating cables or their connections. To obviate such a difficulty an independent automatic stop valve is placed between the operating valve and the cylinder. The water, in passing in and out of the cylinder, is compelled to pass through this valve. The movement of the elevator piston, at its terminals, closes this valve, so that when the car has reached the top floor the piston has automatically encountered and closed the valve, thus preventing the further rise of the car by cutting off the water supply. In descending the same encounter takes place when the car is within a few feet of the lowest landing. The exit of the water is in this way prevented, and the car safely and gradually stopped. It follows, from the use of this valve, that at the terminal landings of each trip the movement of the independent automatic stop valve safely arrests the car's movement without the interposition of the change valve or any interference from within the car. It has been by the aid of such carefully designed devices that accidents to properly built elevators have been so rare. Indeed, the proportion of accidents to the number of elevators in use is insignificantly small. Although there are no available statistics to cite in confirmation of this claim, yet the statement will be accepted for want of any contradictory information.

In summarizing the condition of the elevator in the present stage of its evolution, it is not necessary to point out the many advantages resulting from its use. Its development has permitted the architects of our own time to erect Babel-like structures, the necessity for which is growing greater each day. In the larger cities, upon all sides, we are confronted by structures rising in many instances to the

*Read before the Engineer's Club of Kansas City.

hight of 15 and 16 stories. Such buildings demand elevator service of the most advanced type. Speed, therefore, has become the great desideratum. Taking one of the most prominent examples, to show the high rate of speed at which passenger elevators are compelled to travel, the inestimable value of the safety features I have touched upon becomes easily apparent. The passenger elevators supplying the service to the offices in the tower of the Chicago Auditorium building travel through a distance of 220 feet at a speed of 600 feet per minute, or about 7 miles per hour. The requirements for the ordinary buildings compel a speed of from 300 to 450 feet per minute.

It is not difficult to surmise what will be the requirements of this nature within the next few years. There is no evident sign of the intention of our architects to restrict themselves in the hight of their future buildings to "anything under the sun," and unless some "confusion of tongues" shall come upon them, we may find them emulating the example of those who built the first "tower" of which we have any definite knowledge. It is certain that the requirements for elevator service in the future will be somewhat exacting. In the past those engaged in the manufacture of this class of machinery have kept fully abreast of the constantly changing conditions; and in the future there is every reason to believe that the elevator's evolution, still going on, will follow closely the necessities of the demands which created it.

Germany's Last Census.

The results of the latest quinquennial census of Germany have already been sufficiently ascertained to make it clear that there has been a steady and general, and in some cases a remarkable, increase in the population of almost all portions of the German Empire. This increase is not confined to the towns, but extends to the rural districts in almost all the States of the Empire. At the same time, it is in the towns that the greatest increase has taken place, and in some of them the growth has been very rapid since the census of 1885. Ever since the foundation of the new German Empire in 1871 each successive census has shown a remarkable increase in the urban population, and the census of 1890 proves no exception to the rule. Thus we find that the number of cities with more than 100,000 inhabitants has in the last five years increased from 21 to 26. The number between 50,000 and 100,000 remains the same as five years ago, but the towns of between 20,000 and 50,000 inhabitants are more numerous by nearly 20 than they were in 1885.

With regard to the rank of the chief cities of Germany in point of population, several important changes have taken place. Berlin, of course, still remains the first city of the Empire, a long way ahead of all its rivals. Its population is now over a million and a half. According to the preliminary report, the inhabitants of the capital on December 1, 1890, numbered exactly 1,574,485. The increase in the five years was, therefore, 259,000, or more than 50,000 a year. At this rate of increase the population of Berlin will have overtaken that of Paris within 15 years from the present time. Next to Berlin, Hamburg still stands the second city in the Empire. According to the recent enumeration, its inhabitants now number 570,534, being an increase of 99,534 since 1885. In proportion to its population Hamburg has been increasing even more rapidly than Berlin. Hamburg has added rather more than 21 per cent. and Berlin rather less than 20 per cent. to its population since 1885. By far the most remarkable of the changes which have taken place in the other great towns of Germany since 1885 is that which has occurred in Leipsic. Here the increase is enormous. In 1885 Leipsic stood in the seventh place in point of population; it now ranks as the third largest town in the German Empire, while Breslau, which had hitherto held the third place, has sunk to the fifth. In 1885 Leipsic had only 193,772 inhabitants. It now numbers 353,272. The increase in the five years has, therefore, been 159,500, being at the rate of no less than 82 per cent. Next to this great Saxon town comes Munich, the capital of Bavaria, which now has a population of 344,898, showing an addition of nearly 83,000 in the space of five years.

In addition to the preceding five towns, which have populations of more than 300,000, there are three cities with between 200,000 and 300,000 inhabitants—that is, Cologne, 282,537, increase 43,000 since 1885; Dresden, 276,085, increase 29,999, and Madgeburg, 200,071, increase 40,000. Next come 17 cities with between 100,000 and 200,000 inhabitants. Throughout the whole list it is found that the largest absolute and relative additions have been made in the centers of industry, manufactures and commerce. In the great industrial centers, such as Leipsic, Munich, Cologne, Madgeburg, Frankfort, Hanover, Dusseldorf, Nuremberg, Furth, Chemnitz, Elberfeld, Halle and Mannheim, and in the ports of Hamburg, Altona and Kiel, the population has increased more than 15 per cent., in Kiel even about 33 per cent. Berlin has grown at the rate of 19.7 per cent. It is noteworthy that the principal towns in the States annexed to Prussia in 1866 have once more increased on an average at least as much as those of the older Prussian provinces. This is true, also, of the chief towns of Alsace-Lorraine. Strasburg, for example, has grown 10½ per cent., and Metz nearly as much. The increase of Stuttgart is about the same.

The Munton Tire Mill.

S. Higgins of Badsley Grove, Rotherham, England, has written to the editor of *Engineering* in answer to criticisms of the Munton tire mill, in which he says:

He seems to doubt the slitting being done, and I wish to inform him that I have seen it done on Mr. Munton's mill without any fin or ragged edges; the formation of his rolls and cutters prevent all that. I may also inform Mr. Jackson that Mr. Munton can, and has, slitted from ingots 40 tire blooms in one hour, and can go on the same rate the day long, day after day, without the slightest sign of a fin or ragged edge. In finished tire rolling I have seen Mr. Munton roll any width required without changing rolls, providing the sections are the same. Also I have seen him roll a tire from a bloom 6½ inches wide and finish it 9¼ inches wide (to perfect section); I have also seen him put a 1200-pound bloom on the mill and roll it out to 5 feet in diameter, he has then reversed the pressure and rolled it back to a bloom again in two minutes, then rolled it out again to the finished size, all at one heat; he can also with his edging rolls edge down from any width to any width, say from 12 inches or more to 3½ inches, or less if required, or spread out from 3½ inches to 12 inches or more during the operations of rolling a tire at a single heat. I may also mention that during the visit of the Iron and Steel Institute to America some of the English members saw Mr. Munton's mill slitting ingots, and in their presence slitted an ingot into three tire blooms; the time occupied was under one minute from the time of putting the ingot on the mill to taking off the finished bloom; they also saw him place on the mill a small plain tire 36 inches in diameter without any flange, and at one heat he rolled it back 2 inches, and in the process of rolling he produced a flange on the outside and a snip inside; the tire was finished 34 inches in diameter. I think this will show the importance and usefulness of his reversing pressure and his edging rolls. Mr. Munton can and does control effectually his numerous rolls, and he has no fins or ragged edges to contend with, and his four guide and rounding rolls are under such perfect control that they open with the expansion of the tire as it is being rolled, and keep in close contact with the outer face of the tire, and they travel so truly that when the tire is taken off the mill it is found to be perfectly round. A set of rolls for this mill will wear twice as long as the rolls on any other mill yet made.

Aerial Navigation.

Octave Chanute, the eminent civil engineer, has published in pamphlet form a lecture on aerial navigation, delivered to the students of Sibley College, Cornell University. He reaches the following conclusions:

A measurable success has been attained with navigable balloons. They have been driven 14 miles per hour, and it is probable that speeds of 25 to 30 miles an hour, or enough to go out when the wind blows less than a brisk gale, are even now in sight. Very much more speed than this is not likely to be obtained with balloons, for lack of sufficiently light motive power and because of unmanageable sizes. Much greater speeds can perhaps be attained eventually with aeroplanes. Recent investigations indicate this, but even a beginning is prevented by the lack of a light motor and by questions as to the stability of the apparatus, as well as to safe ways in gaining high initial velocities. Whether these difficulties will ever be overcome no one knows, but they indicate the direction for investigation and experiment, while the probable benefits to man of a solution of the problem are so great that they are well worth striving for.

Success with aeroplanes, if it comes at all, is likely to be promoted by the navigable balloon. It now seems not improbable that the course of development will consist, first, in improvements of the balloon, so as to enable it to stem the winds most usually prevailing, and then in using it to obtain the initial velocities required to float aeroplanes. Once the stability of the latter is well demonstrated, perhaps the gas bag can be dispensed with altogether, and self-starting, self-landing machines substituted, which shall sail faster than any balloon ever can. If we are to judge of the future by the past, such improvements are likely to be won by successive stages, each fresh inventor adding something to what has been accomplished before; but still, when once a partial success is attained, it is likely to attract so much attention that it is not impossible that improvements will follow each other so rapidly that some of the present generation will yet see men safely traveling through and on the air at speeds of 50 or 60 miles per hour.

President McLeod of the Reading Railroad has effected an agreement with the Lehigh Valley Railroad by which the latter company will hereafter handle the coal traffic of the Reading company between Bound Brook and Perth Amboy until the completion of the Reading's new Port Reading branch. Heretofore this traffic has been carried over the Central Railroad of New Jersey between Bound Brook and Port Liberty, the shipping point of latter company on New York harbor.

Triple-Expansion Duplex Pumping Engine.

The object aimed at by the designers of this engine—C. C. Worthington of Irvington, N. Y., and A. J. Caldwell of Brooklyn, N. Y.—was to increase the economy while preserving the duplex arrangement of the Worthington pumping engine by providing a simple and compact adaptation of triple-expansion cylinders and receivers that would permit of a uniform and constant action on both sides of the engine. In general this engine consists of a duplex engine having two high-pressure steam cylinders arranged one on each side and exhausting into a common receiver, from which an intermediate steam cylinder placed on one side is supplied, this cylinder in turn exhausting into another receiver, from which a low-pressure steam cylinder placed at the other side of the engine is supplied. The induction pipes of the two high-pressure cylinders are provided with separate throttles by which the steam admitted to them may be adjusted so as to secure an equal and constant effort on both sides of the engine. The cut-off valves in the intermediate and low-pressure cylinders are arranged so as to prevent a sudden accession of pressure in them at the end of the stroke, due to the exhaust of the cylinders on the other side of the engine into their respective receivers.

The four cylinders are arranged in pairs, the high-pressure A and intermediate C forming one side, and the high-pressure B and low-pressure D forming the other. One piston rod is common to each pair. The tanks G H are arranged, with respect to the cylinders, as shown on the drawings.

The water end of the engine or pump proper consists of two cylinders, L K, having plungers connected directly with the piston rods E F. These cylinders are of the usual construction. Between the water and steam cylinders the piston rods E F are connected to crossheads, sliding in fixed guides, and acted upon by the piston rods of two pairs of oscillating compensating cylinders, having pistons which act in opposition to the main piston rods during the first part of the stroke of the engine and in conjunction therewith during the last part of the stroke. These crossheads are provided also with transverse arms, which are connected at their inner ends to crank arms on shafts, being provided with crank arms, from which rods extend to the cranks of the induction and eduction or exhaust valves of the engine, each piston rod, through this construction, operating the induction and exhaust valves of the other side of the engine. The transverse arms are connected at their outer ends by links to crank arms on shafts, which operate the cut-off valves of the engine, the cut-off valve for each side being operated by the piston rod of its own side. The engine is provided also with the usual balancing pistons, connected to the respective piston rods E F.

The high-pressure cylinders A B receive their supply of steam from steam pipe 23, provided with a throttle, 24, and communicating with the cylinders by means of induction pipes 25, communicating with steam chests 26 27 at the opposite ends of the cylinders. The induction pipes 25 are each provided with a throttle, 28, by which the amount of steam entering the respective cylinders A B may be independently regulated, for a purpose which will be described later. The cylinders A B are provided with the usual exhaust pipes 29, communicating with opposite ends of the cylinders, and exhaust into the tank G, placed between the two cylinders, the exhaust entering the tank at opposite sides. This tank is provided with a port at each side, through which the exhaust pipes 29 communicate with the tank, and with a series of reheater tubes, through which steam is introduced by means of a feed pipe, 31, the steam after passing through the tubes escaping through a drain pipe. The feed and drain ports are located in a chamber formed at the base of the tank, this chamber communicating with the reheater tubes and being

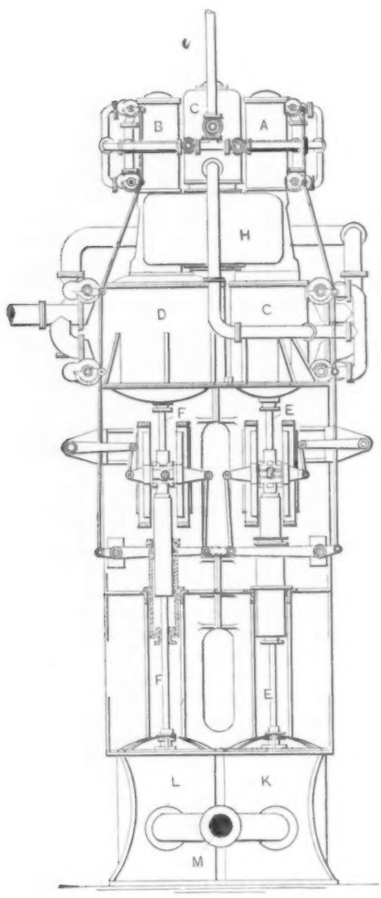


Fig. 1.—Front Elevation.

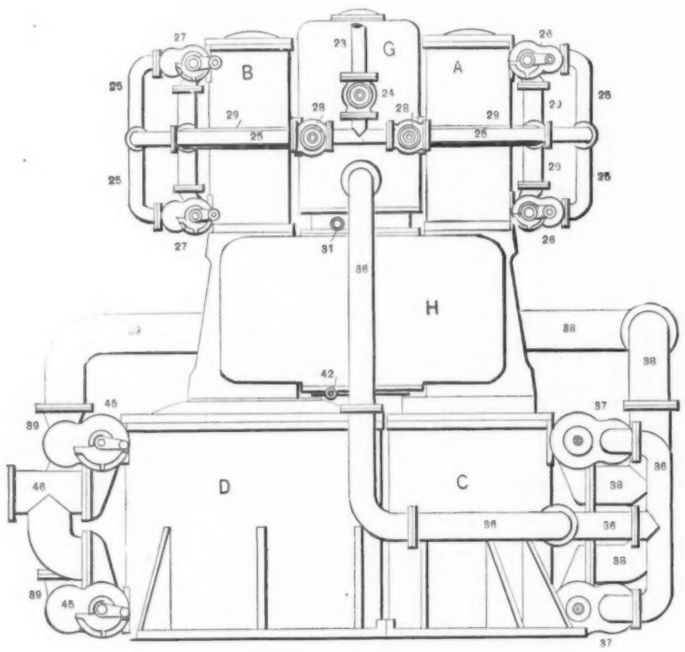


Fig. 2.—Front Elevation of Steam End.

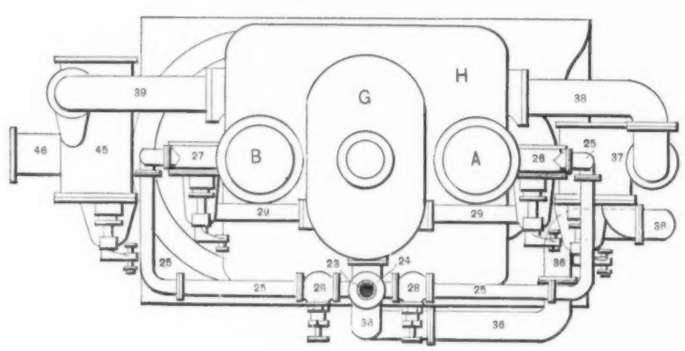


Fig. 3.—Plan View of Steam End.

TRIPLE-EXPANSION DUPLEX PUMPING ENGINE.

provided with a central perforated partition to secure the slow circulation of the reheating steam through the tank. The feed and drain pipes are controlled by cocks. The tank is also provided with a nozzle, communicating with the induction pipe 36, by which steam is supplied from this tank to the intermediate cylinder C through the steam chests 37 at opposite ends of the cylinder. The cylinder C exhausts into the tank H through the exhaust pipe 38, communicating with opposite ends of the cylinder. The tank H is provided at opposite sides with ports communicating with the exhaust pipe 38 of the intermediate cylinder C and with the exhaust pipes forming the means of communication between the tanks and the cylinders to be placed so as to form a direct and short connection without interfering with other parts of the engine. The induction pipe 39 from the tank H communicates with the low-pressure cylinder D through the steam chests 45 at the opposite ends of the cylinder. The low-pressure cylinder D exhausts through a pipe, 46, communicating with a condenser or the open air, according to the type of engine.

The valve apparatus is preferably of the form shown; its construction and operation will be understood from the drawings. As the piston of the high cylinder A completes its stroke away from the water cylinders the valves will be in such a position as to close the induction port at one end of the cylinder and open the exhaust port at the other end of the cylinder, and at the same time the movement of the induction and exhaust valves of the cylinder B has been completed, so as to start the piston of that cylinder and cause it to make a stroke in the same direction. As the piston of the cylinder B makes its stroke it will, through the piston rod F, crosshead and connections, oscillate the valves of the cylinder A, and as the piston rod arrives at the middle of its stroke the valves of the cylinder A will arrive in their mid position, in which they close the induction and exhaust ports of the cylinder, and the continued movement of the piston rod F will immediately commence to open the induction port at one end of the cylinder A and the exhaust port at the other end, and as the piston of cylinder B completes its stroke the valves of cylinder A will arrive in such a position as to completely open the induction ports in front of the piston of cylinder A and the exhaust ports behind it. The piston of cylinder A will then commence its stroke, and as it arrives at the middle or about the middle of the stroke it will, through the piston rod, crosshead and connections operate the cut-off valves to prevent the further admission of live steam in front of the piston, and at the same time open the port at the opposite end of the cylinder to admit live steam for the next stroke.

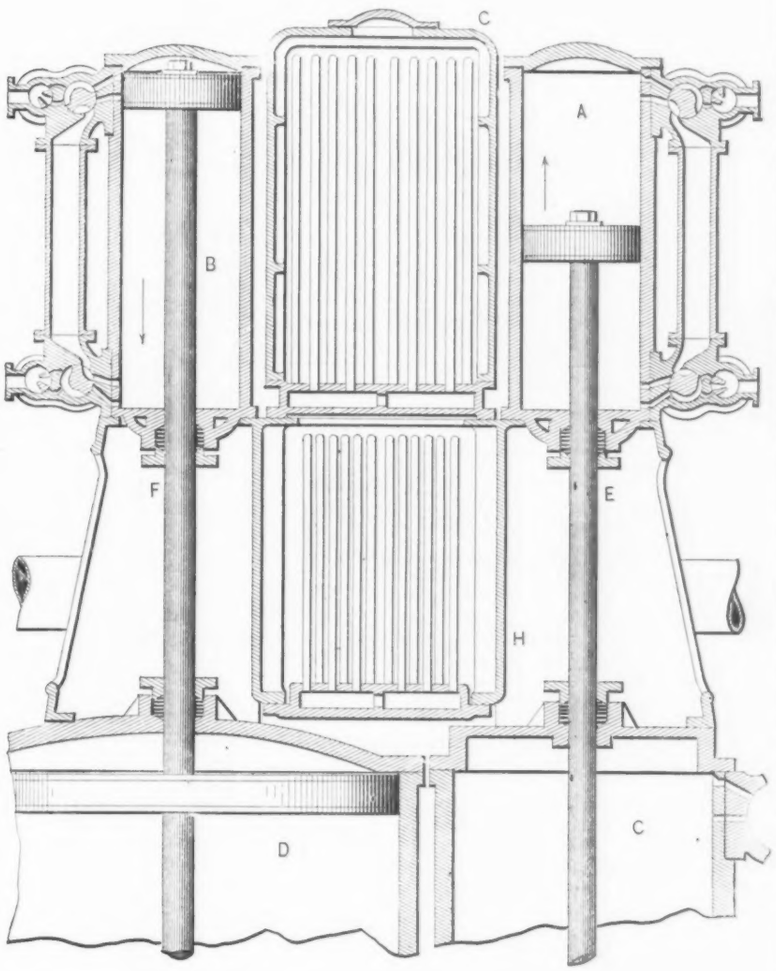


Fig. 4.—Vertical Section through Steam Cylinders, Valves and Tanks.

TRIPLE-EXPANSION DUPLEX PUMPING ENGINE.

induction pipe 39 of the low-pressure cylinder D. The tank is provided, also, with a series of reheater tubes, and receives steam through a feed pipe, the steam after passing through the tank escaping through a drain pipe, the chamber with which these pipes connect being located at the base of the tank and divided by a partition, and the pipes being controlled by cocks, as in tank G.

The tanks G H may be arranged in any desired manner, but are preferably positioned as shown, the tank H being placed above and forming the heads of the intermediate and low-pressure cylinders, and providing, also, a support for the tank G, which is mounted directly above and upon it and between the high-pressure cylinders, this construction affording a compact and convenient arrangement of tanks and one enabling the induction and

As the supply of steam to the high-pressure cylinders is uniform, its continuous admission throughout the stroke would not interfere with the steady and uniform action of the engine. But this is not the case with the intermediate and low-pressure cylinders, since, as the high-pressure cylinder B exhausts into the tank G toward the end of the stroke of the piston of the intermediate cylinder C, a sudden accession of pressure would be caused in that cylinder, thus producing a sudden increase in the force operating the piston, and disturbing the uniform action of the engine. The same would be true of the low-pressure cylinder. The cut-off valves at the opposite ends of the intermediate and low-pressure cylinders operate to prevent this sudden accession of pressure, being so timed as to cut off the supply of steam from the tanks at the proper time to prevent the exhaust from the tanks from affecting the steam supply of the respective cylinders. An equal and uniform action of the engine at every point of its stroke is thus secured, each of the intermediate and low-pressure cylinders being compelled to receive its entire supply of steam from its tank prior to the exhaust of the cylinder on the opposite side which communicates with the tank.

It is necessary in this class of engines that the two sides should have a regular and uniform movement at all times and that the total effective power on the two sides of the engine should be equal and constant, any variation in the power on one side relatively to that of the other side causing a disturbance in the action of the engine and preventing the attainment of the greatest economy in its operation. It is apparent that in the construction here shown the admission of the same amount of steam to each of the high pressure cylinders A B may produce an inequality in the action of the engine, due to the fact that the effective power in cylinder D in combination with that in cylinder B will not under certain conditions be equal to that of the combined effective power in the cylinders A and C. This is especially the case in starting the engine, the steam from cylinders A B passing to cylinder C through the tank and exhaust pipe, so as to produce in cylinder C pressure prior to the accession of pressure in cylinder D. The combined pressure upon the pistons in the cylinders A C will therefore be in excess of that upon the opposite side of the engine, the steam acting upon the cylinder B with a pressure equal to that upon the piston of cylinder A, and it will be some time before an equality of power will be established in the cylinders on opposite sides, during which time the action of the engine is not uniform and steady. In the same way, in case of any change of water pressure by which an excess or deficiency of pressure in cylinder D is produced, the balance between the two sides of the engine will be destroyed and the action rendered uneven. It is desirable, therefore, that some means should be furnished whereby the effective power upon the opposite sides of the engine may be equalized at the starting of engine and adjusted readily at all times. For

this purpose the induction pipes 25 with throttles 28 are provided by which the amount of steam entering each of the cylinders A B may be readily adjusted, so that the effective power upon the two sides of the engine shall be uniform and any variation quickly corrected. The operation of these throttles will be readily understood. In starting the engine both throttles are used and more or less steam admitted to the respective cylinders A B until a uniform action of the engine is secured, it being apparent that an excess of steam will first be required in cylinder B to balance the excess of power on the other side of the engine, due to the power exerted upon the piston of cylinder C, and that this excess of steam will be gradually reduced as the cylinder D receives its supply from tank H until the supply of steam to cylinder B is equal or nearly equal to that of cylinder A. Similarly, in case of any unevenness in the action of the engine after starting, due to any excess or deficiency of pressure in cylinder D, the amount of steam admitted to cylinders A B may readily be adjusted by the throttles so as to compensate therefor.

It is evident that the same general arrangement above described may be applied to a horizontal high or low duty engine. In the latter case the tanks may be arranged in any desired position, but will preferably be constructed to form a portion of the foundation upon which the intermediate and low-pressure cylinders rest, thus economizing in space and affording means for a convenient and short connection between the tanks and the cylinders.

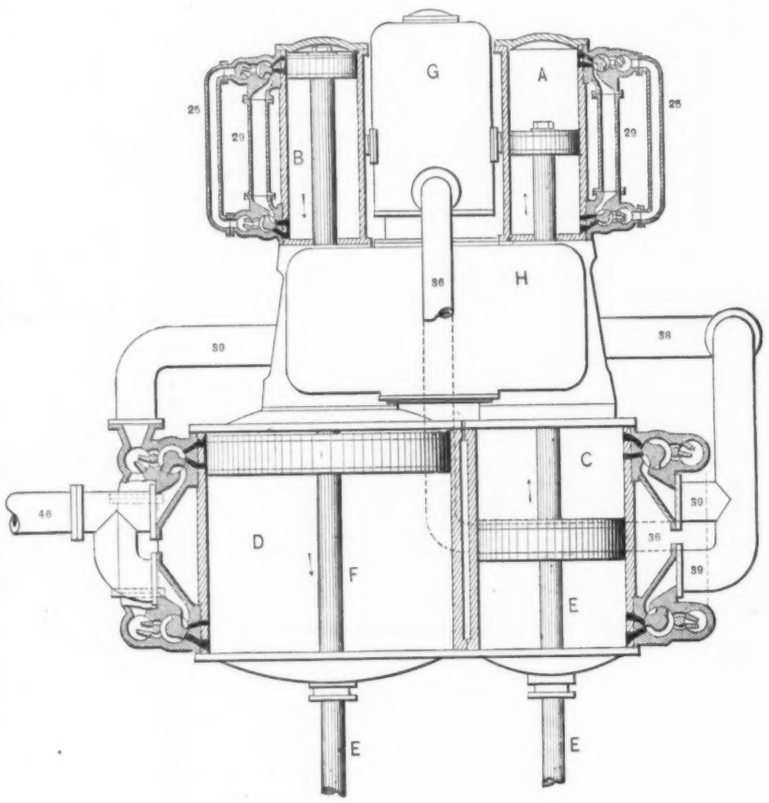


Fig. 5.—Diagram of Cylinders, Steam Pipes and Valves.

TRIPLE-EXPANSION DUPLEX PUMPING ENGINE.

Electric Railways.

Few people have any conception of the enormous extent of city and suburban traffic in the cities of the United States. A few statistics have been lately submitted in a lecture before the New York Electric Club by F. L. Pope. The official returns show that during the year ending September 30, 1889, the 110 street railways in the State of New York carried over 686,000,000 passengers, or 100 times the total population. In New York City alone the surface and the elevated roads carried together about 400,000,000. In Boston, 100,000,000, and in Philadelphia, 150,000,000 passengers, were carried. In fact, statistics indicate that the street railways in the United States carry something like twice as many passengers as all the steam roads, and, moreover, it has also been found that the number of passengers increases from year to year in a much greater ration than the population, which means not only that more people ride, but that the same people ride more frequently each succeeding year.

The transportation of this enormous number of passengers, probably not less than four or five billions, taking the whole country together, with safety, comfort, speed and economy, must be recognized as an undertaking of the most gigantic description.

Mr. Pope dwelt briefly on the nature of the three methods of overhead, conduit and storage traction, and then in a very interesting manner gave the details of the work of Thomas Davenport and Page, exhibiting a copy of the *Electro-Magnet*, a little weekly paper printed by Davenport in this city just 50 years ago. After pointing out the impossibility of achieving any great result with chemical batteries as the source of power, Mr. Pope came to the invention of the dynamo, the discovery of its reversibility, and the dawn of the modern era of electric power transmission. He then called attention to the very early work of Stephen D. Field, and to that of Joseph R. Finney, who brought out his overrunning trolley at Pittsburgh in 1882. Mr. Field had in his original plans proposed the use of a conduit, and that method was to-day being eagerly pushed to perfection.

Mr. Pope then dwelt upon the many desirable features of storage traction, but showed that the main objection was a financial one, a storage car mile costing 10.6 cents, or about the same as horses, while the overhead system reached only about 5.09 cents per mile. As to the results of storage-battery operation, Mr. Pope reviewed the expert tests made by himself in 1886, for President Whitney of the West End road of Boston. Coming to the question whether electric railways are dangerous, Mr. Pope said:

"With a view of getting at the actual facts in the case, the Boston *Advertiser*, a few months ago, sent out a circular letter asking information from every city in which electric railways are in actual operation, from Portland, Maine, to Galveston, Texas. It was asked what system was used in each place; whether there had ever been loss of life or injury from the wires; whether there was any serious objection on the part of the public to overhead wires, and what was the general opinion in the locality as to the effect of the introduction of electricity upon the street railway service? Replies were published from 64 cities and towns. All but four of them were favorable. Not one solitary instance of accident or serious injury from electric currents was reported. One of the objecting places was Newport, R. I., where it seems the 'upper ten' strenuously opposed the introduction of anything that would popularize riding on the streets.

"An extraordinary amount of nonsense has been printed and talked in respect to the alleged dangers of both electric light and railway wires. The public have been needlessly alarmed by the exaggerated statements of interested parties; but, nevertheless, the danger is so small, as a matter of fact, that the actual figures are almost astonishing. Most of the accidents which have been reported occurred in New York City. Yet the statistics show that in 1889, out of 1467 deaths in New York City by accidents of various sorts, only nine were due to electricity, a considerably less number than were killed by being run over by horse cars. Not a single death was recorded in Boston, although there are perhaps more wires there in proportion to the population than in New York. There are in the six New England States nearly 140 arc light stations, burning over 20,000 arc lamps and distributing 30,000 horse-power of electricity through the streets of the principal cities and towns. During the last ten years, so far as I can ascertain, there have been but five deaths from electricity; four of these were employees of the lighting companies, and one was a careless boy who climbed upon a shed and took hold of a wire. During the same ten years the steam railroads of New England have killed 2339 employees and 2902 other persons—5241 against 5. Not only is electrical power far less dangerous than the same quantity of power used in other industries, but it is relatively safer, as the few accidents that do occur are among the employees. These remarks refer to electric wires in general. Now as to electric railway wires:

"I believe that it is an incontestable fact that not one single man, woman or child has ever been killed or even seriously injured by a 500-volt current, which is the highest pressure ever permitted upon electric-railway wires. Every alleged case of accident by railway wires has, upon

investigation, proved to be either without foundation or to have been caused by an electric-light current. When we consider that shocks have been experienced by men, women or children, persons of all ages and all sorts of physical conditions, sometimes for a period of several minutes, experience seems to warrant the positive assertion that the electric railway current is not dangerous to human life, and that we may dismiss that question from further consideration.

"Many persons are alarmed at the vivid flashes of light which are often seen at night beneath the wheels of an electric car, and at the point of contact of the trolley wheel with the overhead wire, and are under the impression that they must indicate a very dangerous electric pressure. Such, however, is not the case. In an electroplating establishment at Ansonia, Conn., I once saw a workman accidently set a tin pail filled with water upon a pair of electric conductors near the dynamo. The pail instantly disappeared, being not merely melted, but being converted into metallic vapor, with a terrific flash which illuminated the whole building with a dazzling and instantaneous radiance; yet the current which produced this startling phenomenon was of such low pressure that it was impossible to detect its presence by the sense of touch, even by applying the hands directly to the bare conductors.

"The average speed of the horse car is about six miles per hour. The question is sometimes asked: How fast may electric cars be safely run in a city street? One fact within my own knowledge will go far to answer this questfon. There is a heavily traveled street in Pittsburgh only 36 feet wide, containing a double-track cable road, which leaves not more than 9 feet space on each side. At first the cable cars were run at the rate of seven miles per hour; afterward the speed was increased to nine and one-half miles per hour. The records show that there are not so many accidents under the present arrangement as there were before. Pedestrians and drivers are more careful and take fewer chances. The schedule rate of the electric cars in Cleveland is nine miles per hour, and in some parts of Boston as high as 12 miles. The value of an electric railway to the public is largely determined by its speed, but the economical aspect of the question is equally important. If we make six miles per hour with horses and nine with electricity, each car does 50 per cent. more work without increased expense for conductors' and drivers' wages, which is an important item. Another economical feature due to the use of electricity is the ability to haul one, or even two, tow cars without loss of schedule time on special occasions when the traffic is unusually great.

"Nothing is more astonishing than the capacity of the electric cars to make their schedule time in the face of the heavy storms of a New England winter. It is a common sight to see an electric car running apparently with perfect ease up a heavy grade through snow a foot deep, pushing or pulling other cars loaded to their utmost capacity.

"The total number of electric cars now running in this country is probably between 2500 and 3000. Of the whole number I presume not more than 30 or 40 are operated by storage batteries. The fact that the overhead system, though introduced at a later period than either the storage system or the underground distribution system, has so far surpassed them both goes far to show that as yet it is the only system which has been able to meet the various exacting requirements of our street railway service."

Mr. Pope then spoke in terms of praise of the work of C. J. Van Depoele, Leo Daft and F. J. Sprague, and closed as follows:

"The limits of time compel me to content myself with the briefest possible refer- to the most important development of electrical transportation which has yet come before the public—the electric underground railway. This undertaking having been placed in the hands of electrical engineers whose competency cannot be questioned and backed by ample capital, has proved in London a phenomenal success. We are now assured that a syndicate of the most prominent capitalists of New York have undertaken to establish a system of transportation upon the same plan, consisting of a network of tunnels at a depth of 100 feet beneath the surface, and connecting all important points not only in the city itself, but in the adjacent sections of Long Island and New Jersey. In such a system it necessarily follows that the train must be run by electricity to the exclusion of any other power.

"Every thoughtful person realizes that something must be done at once, not only to relieve the congestion of traffic which already exists in the streets of New York, but to provide for the enormous yearly increase which must be taken into the account. Statistics show that the traffic of the horse cars and elevated lines in New York has increased 46 per cent. within the five years from 1884 to 1889. A careful estimate which has recently been made of the movement of passengers in and about New York during the year 1890 gives the following amazing results:

New York City (surface and elevated roads)	400,000,000
Brooklyn Bridge	38,000,000
Long Island ferries	90,000,000
Staten Island and New Jersey ferries	85,000,000
Total	603,000,000

"If the profit derived from carrying these passengers amounts to only 1 cent each per trip, it nevertheless figures up to the snug little sum of $6,000,000 per annum, which makes a very comfortable dividend upon a capital of $100,000,000. Such a system would admit of the running of solid trains at very short intervals through the city, to and from all points in the suburbs, in every direction, and I venture here and now to predict that within the next 20 years, if not the next 10 years, electrical underground transportation will be brought to such a state of perfection that a passenger entering one of the central stations of New York may be deposited at his home station at any point within a radius of 10 miles in 15 minutes' time and at a fare of 5 cents. And this magnificent result is to be the contribution to the convenience and prosperity of the public of the electrical engineer."

The revised census results for Massachusetts show the further remarkable growth of urban population in the past ten years. There are now 47 cities and towns of 8000 or more people, against 33 in 1880, and of the total increase of 455,858 in the population of the State during the ten years, 402,941 is to be found in these 47 places. They are credited with an aggregate populatton of 1,564,931, against 2,238,943 for the whole State, or just about 70 per cent.; leaving for other places only 674,012 people, some 175,000 of whom must live in places of between 4000 and 3000 population, and might properly be grouped as urban. The State of Massachusetts, therefore, appears to be mainly an aggregate of cities and large towns.

The new smelter building of the New Jersey Zinc and Iron Company, at Newark, N. J., is now being built by the Berlin Iron Bridge Company of East Berlin, Conn., from their own designs. The building is 52 feet wide x 216 feet long, and entirely fire proof.

Basic Steel in the South.

W. H. Hassinger, a very well known Birmingham rolling mill manager, has been connected lately with the efforts being made in Alabama to manufacture basic steel. Mr. Hassinger, after alluding to theoretical matters and briefly reviewing what has been done in the South, proceeds as follows, in an article printed in the *Polytechnic* of Troy:

While this was going on in the North, the South was being developed and its unlimited beds of ore and coal in close proximity enabled manufacturers to produce iron at a cost so low as to startle veteran ironmasters from their apparent security and induce others to investigate a field that held out such promising rewards, until to-day Alabama stands third in the iron-producing States, having very nearly doubled its production in the last year.

This iron is especially adapted to the manufacture of basic steel, and I give below analysis of it:

Grade.	Silicon.	Sulphur.	Phos.
No. 1 Foundry	3.12	0.022	0.57 to 0.64
No. 2 Foundry	3.00	0.030	0.57 to 0.64
No. 3 Foundry	2.55	0.020	0.57 to 0.64
No. 1 Soft	3.65	0.014	0.57 to 0.64
No. 2 Soft	4.14	0.013	0.57 to 0.64
No. 1 Silver Gray	4.50	0.012	0.57 to 0.64
No. 2 Silver Gray	4.85	0.010	0.57 to 0.64
Gray Forge	1.93	0.070	0.57 to 0.64
Mottled	1.26	0.097	0.57 to 0.64
White	0.84	0.289	0.57 to 0.64

An examination of the above table will show that the phosphorus is too high for the acid Bessemer and open-hearth processes and too low for the basic Bessemer, therefore the process on which all hopes are centered is the basic open hearth. The specification for pig iron in this process calls for low silicon, below 1 per cent., low sulphur, and with phosphorus as low as can be obtained, but of little importance.

A further examination of the above analysis will show that the pig iron contains both high silicon and high sulphur. We must first lower the silicon and sulphur. In blast-furnace practice the sulphur can be partly eliminated, but this produces a corresponding rise in the percentage of silicon, and *vice versa*. While enough suitable pig iron could be obtained to run an ordinary plant, yet to produce basic steel on a large scale it would be necessary to apply the duplex process—that is, to blow the metal in a converter and desiliconize before delivering to the open-hearth furnace. This can be easily done, and will bring advantages to the open-hearth furnace which will fully compensate for the extra expense of blowing. The pig metal from the cupola is blown for four or five minutes, or until the silicon is eliminated to about 0.25 per cent. Up to this time the loss of iron in the converter is reduced to a minimum, and therefore the expense of blowing is small, not exceeding $2.50 per ton.

The slag can more easily be kept basic and the amount of lime required correspondingly reduced. The sides and hearth will not suffer cutting from the silica, and the time consumed in melting the steel will be materially lessened. A great deal of time is otherwise lost in charging and bringing to a boil. Steel is now being successfully made by the basic open-hearth process at the works of the Henderson Steel Company, Birmingham, Ala., in a 13-ton Siemens furnace, with magnesite brick sides and bottom and silica roof. The magnesite brick, which are virtually indestructible, are imported from Europe, it having been found by experience that the usual dolomite hearth used on the Continent had to be abandoned on account of the highly silicious character of our pig iron. The hearth is now built with these brick above the slag line and

the bottom is made with calcined magnesite. Magnesite is the only basic material which can be placed in direct contact with the acid walls of the furnace. On the continent when calcined dolomite and anhydrous tar are mixed and rammed for a bottom and sides, some such neutral material as chrome ore is used to separate it from the walls and roof of the furnace. Little or no repairs are necessary after each heat. This furnace is making on an average from 25 to 30 tons of mild steel daily and could very much increase its output but for the delay occasioned by casting into small 6 x 14 molds (they having no blooming train at present to break down larger sized ingots). A test heat made consisted of:

Native white pig iron phos , 0.68

	Pounds.
per cent.	15,000
Pit scrap from former heats	5,525
Miscellaneous wrought scrap	4,514
Native brown ore, 55 per cent. Fe	1,300
Limestone	2,900
Spiegel	200
Ferromanganese	200
Total metal	25,439

And there was drawn from the furnace:

	Pounds.
Steel, 24 ingots	22,550
Pit scrap	1,510
Total	24,060

Showing a waste of metal of about 6 per cent., pit scrap 6 per cent. and 88 per cent. of ingot steel. In most basic open-hearth practice it is necessary to tap off the slag just before the end of the heat. This is not done at the Henderson plant, as the phosphorus is not so high as to require large basic additions, and thereby making the slag thick and unruly. A small addition of fluor spar easily liquifies the slag, and the retention of the slag assists in making a better steel.

This steel gave the following analysis: Carbon, 0.08; manganese, 0.29; silicon, trace; phosphorus, 0.018; sulphur, 0.066.

The analyses show very low phosphorus and low carbon, but rather high in sulphur. It is, however, not high enough to affect the quality of the steel, and when combined with low phosphorus does not interfere with the rolling, steel containing as high as 0.13 sulphur having been successfully used. A coupon taken from a $\frac{5}{8}$-inch rolled plate, area $\frac{5}{8}$ x 1 inch, gave:

	4 inch sec.	8 inch sec.
Ultimate tensile strength,	Pounds.	Pounds.
square inch	48,110	48,660
Elastic limit, square inch	32,030	32,275
	Per cent.	Per cent.
Reduction of area	54.7	57.4
Elongation	32	28

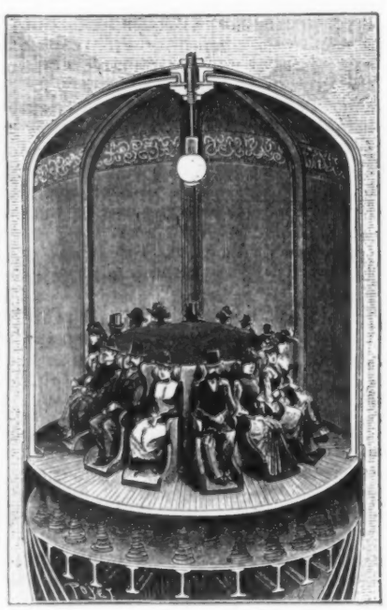
The cost of producing such steel has been shown to be $21.23 per ton of ingot 2240. This cost of production has been severely criticized as being too high, it being about $10.75 above the cost of pig iron. The cost of labor in a Northern works for making acid steel is $1.65 and basic $1.90 per ton. The total cost of practice above pig iron is about $6.50, divided by good metallurgists as follows: About one-third labor, one-third waste and one-third for wear and tear. The $4.25 in excess of these figures is due to the small plant, costly handling of material and inexperienced hands. We think we are justified in claiming that steel can be made in Birmingham with a well-equipped plant for less than $20 per ton. As it would be necessary in a large plant to use the intermediate process of blowing the pig iron in a converter, the increased cost of blowing would be counterbalanced by the decrease in wear and tear, labor and general expenses, and would bring the cost of ingots at about the same figure above mentioned, namely $20. The cost of making this same quality steel in Pittsburgh by the acid open-hearth is in the neighborhood of $43. The company here are now building their second furnace and will soon be producing from 50 to 60 tons of ingots daily. Arrangements are also being made to equip a 32-inch blooming train and converters to desilicize.

The advantages of the basic open-hearth over any other process are very great. It is particularly adapted to the pig and ore process. It is possible to produce in a shorter time a much superior steel with inferior stock than that used by an acid furnace. On account of its fast working and being able to use a large range of raw material, it is convenient to manufacture at a very much reduced cost. It may be assumed that the time of operation increases with the percentage of phosphorus, and that for high phosphorus pig iron the time would be about the same as for acid open-hearth—that is, about nine hours. With the duplex process this is not considered, and at Witkowitz, on the Continent, the work is done very rapidly, taking on an average from five to six charges in 24 hours.

The total production of basic steel in America during 1889 was 62,173 tons and other steel 4,466,926 tons, or less than 2 per cent. It is safe to predict that basic steel will have a greater percentage of increase in the next ten years than any other steel and its production will be more than 15 per cent. of all steel manufactured.

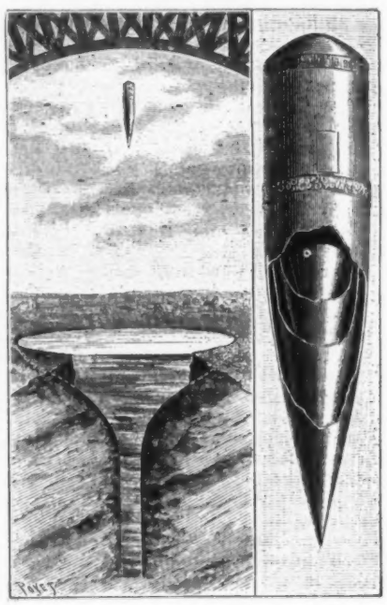
A French Suggestion to Chicago.

Aristide Bergès, a civil engineer, "ancien élève de l'Ecole Polytechnique," has undertaken to offer to those who conduct the Columbian exposition a suggestion in the form of a sensational attraction, through the columns of *La Nature*. He bases his idea on the emotions which accompany a fall from a great



Interior of the Car.

altitude. He suggests the construction of a tower several hundred meters high, from which those asking for new sensations are to be dropped. He figures that at the end of a drop of 300 m. the velocity is more than double that of the fastest train. The main point is to receive the passengers safe and sound at the end of their journey. M. Bergès gives the car the form of a projectile, which he drops into a sufficiently deep well, as shown in the accompanying engravings, which are supposed to cover the requirements of a car capable of holding 15 passengers. The interior dimensions of the chamber are 10 x 13 feet, the floor resting on springs. The lower part consists of a series of cones, in order to prevent the compression of the air in the chamber when the projectile drops into the water. Its total weight is 11 tons and its displacement 31 tons. For



The Well and Car.

a drop of a little over 1000 feet the depth of the water in the well, designed as shown, would be 180 feet. We may add that the designer of this novel plan proposes to fasten the passengers down in their seats.

Steel Armor.

At a meeting of the Royal United Service Institution of Great Britain, held last week, Charles Weston Smith read a paper on "Steel, as Applied to Armor Plates," in the course of which he described a method by which he proposes to make a steel plate having the advantages of ordinary compound armor, combined with those of steel plates. The author recognizes that "wholly steel armor plates are already in the field, and have had a tolerably successful campaign;" but, by the system he proposes to introduce, he seeks to improve the effectiveness of the plates by "graduation of constitution." The manner in which Mr. Smith proposes to accomplish this is "by casting, varying, and sequentiated tempers of steel simultaneously into one ingot mold, so constructed in subdivisions that the varying tempers shall be preserved, each in its integrity, while yet each shall so combine with the other as to form a perfectly graduated whole, the rolled steel partition plates which subdivide the mold constituting by their previously determined qualities intermediary tempers in the final graduated steel armor-plate ingot." The following is the arrangement that Mr. Smith recommends: A very soft back section of the lowest possible tenacity, containing 0.08 per cent. carbon or less. Next to this comes the first partition plate, containing about 0.2 per cent. of carbon. Next is a mid section of from 0.25 per cent. to 0.35 per cent. of carbon. The second partition plate would contain about 0.4 per cent. of carbon. Lastly, the hard face section would have from 0.5 per cent. to 0.65 per cent. of carbon. All these would be blended to constitute one perfectly indivisible whole. Mr. Smith's proposal is by no means new, but as he is

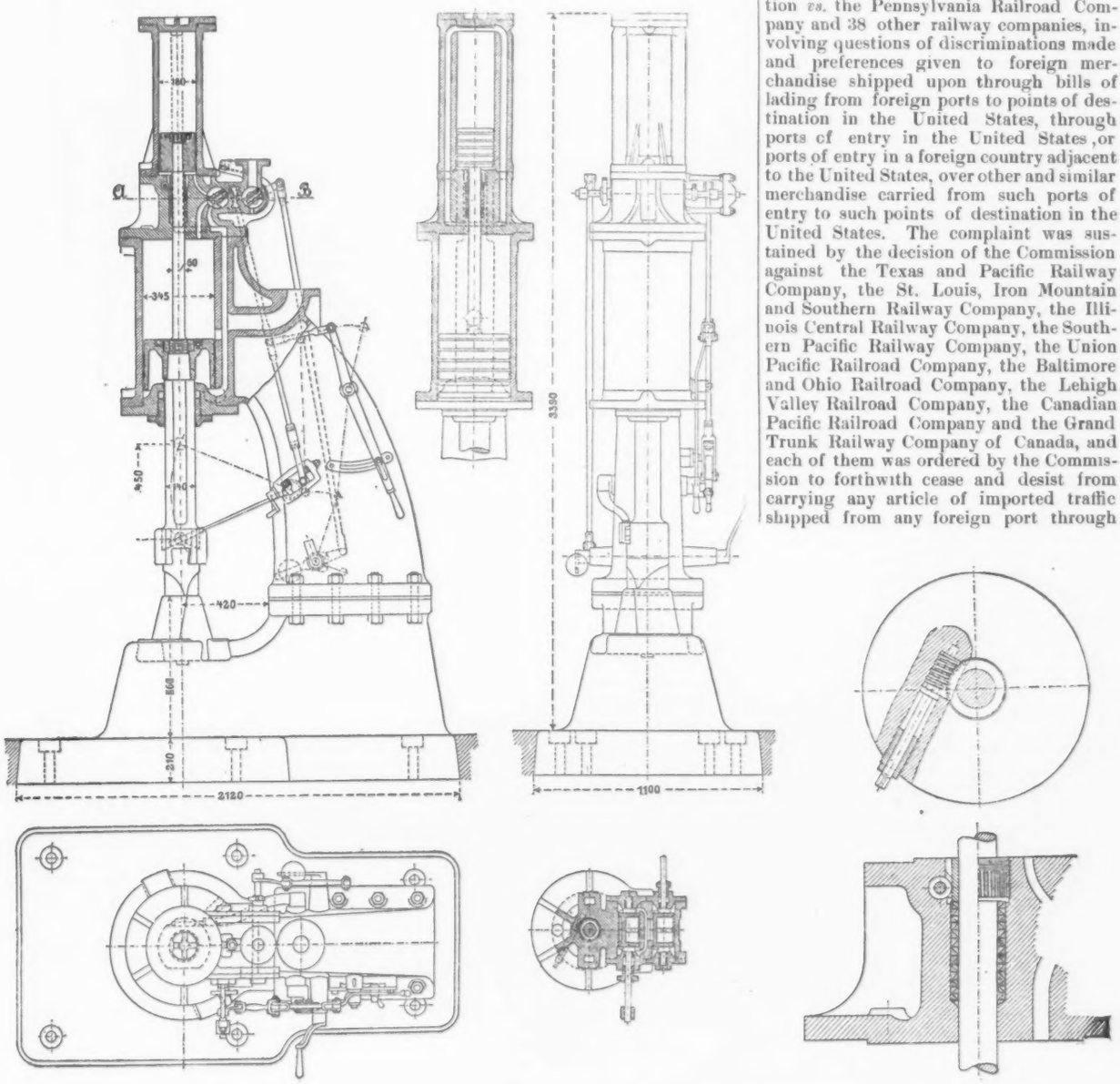
a steel maker he has exceptional facilities for carrying out his plans. Until he does so his suggestions can hardly be considered of great importance.

A Compound Steam Hammer.

It is generally acknowledged that steam hammers consume large quantities of steam, and it is a somewhat surprising fact that the compound system has not been applied to the tool before. J. E. Rienecker of Chemnitz, Germany, has endeavored to overcome this drawback by a design which we copy from the *Zeitschrift des Vereines Deutscher Ingenieuer*. The hammer has two cylinders of different diameters, both single acting. The steam valve is not used as it is in the ordinary hammers for throttling the steam in order to vary the force of the blow, but is always opened full. The valve is so designed that while it admits steam to the upper smaller cylinders, it exhausts from the large cylinder. After the steam has done its work in the small cylinder—*i. e.*, has raised the tup—the valve opens communication between the upper and the lower cylinder, so that the steam in the latter exerts the blow. The valve is actuated by rods from the tup, the stroke being regulated by a hand lever, which may also be used exclusively. The lower cylinder is provided with an opening, through which the condensed water may escape when the piston is at its lowest point

It is claimed that the saving in steam is very great. At full stroke it is 50 per cent., because all the steam for the blow is saved. It is even greater with partial stroke and light blows When the tup is raised only to half its stroke, it is true that only one-half of the steam is used as compared with a full stroke, but in a down stroke, with a double-acting hammer, almost as much steam is required, no matter whether the stroke has been full or not. This waste of steam, which is out of proportion to the amount of work done, is overcome by the compound hammer. The consumption of steam is exactly proportioned to the force of the blow. The handling of the hammer, too, becomes easy and reliable, because the force of the blow is not dependent upon the skill of the hammerman, but upon the quantity of steam which enters the large cylinder after having done its work in the small cylinder.

The first hammer arranged according to this design was an ordinary double-acting hammer altered by placing a large cylinder above the original cylinder. In spite of the drawbacks of this arrangement, the hammer has worked well for a year past.



THE RIENECKER COMPOUND STEAM HAMMER.

Rate Discrimination on Foreign Traffic.

The Interstate Commerce Commission, in an opinion by Bragg, Commissioner, on January 28, decided the case of the New York Board of Trade and Transportation *vs.* the Pennsylvania Railroad Company and 38 other railway companies, involving questions of discriminations made and preferences given to foreign merchandise shipped upon through bills of lading from foreign ports to points of destination in the United States, through ports of entry in the United States ,or ports of entry in a foreign country adjacent to the United States, over other and similar merchandise carried from such ports of entry to such points of destination in the United States. The complaint was sustained by the decision of the Commission against the Texas and Pacific Railway Company, the St. Louis, Iron Mountain and Southern Railway Company, the Illinois Central Railway Company, the Southern Pacific Railway Company, the Union Pacific Railroad Company, the Baltimore and Ohio Railroad Company, the Lehigh Valley Railroad Company, the Canadian Pacific Railroad Company and the Grand Trunk Railway Company of Canada, and each of them was ordered by the Commission to forthwith cease and desist from carrying any article of imported traffic shipped from any foreign port through any port of entry of the United States, or any port of entry in a foreign country adjacent to the United States, upon through bills of lading, destined to any place within the United States, at any other than upon the inland tariff governing other freight at such port of entry to such place of destination, or at any other than the same rates established by such inland tariff for the carriage of other like kind of traffic in the elements of bulk, weight, value and expense of carriage, such order to take effect on and after the 10th day of March, A.D. 1891. The complaint was not sustained as to other defendant railroad companies, and as to them it was dismissed by order of the Commission.

A New Iron Association.

On Friday, the 30th ult., final steps were taken by which the iron manufacturers of the Mahoning and Shenango valleys have been organized into an association, to be known as the Mahoning and Shenango Valley Iron Manufacturers' Association. This organization takes the place of the one which has been in existence in the Mohoning Valley for some years, and was known as the Mahoning Valley Iron Manufacturers' Association. The concerns included in the new association are as follows: The Mahoning Valley Iron Company, the Andrews Iron Company, the Brier Hill Iron and Coal Company, Cartwright, McCurdy & Co., the Youngstown Iron and Steel Company, Andrews & Hitchcock, Ohio Iron and Steel Company, American Tube and Iron Company, the Lloyd-Booth Company, of Youngstown, the Girard Iron Company, Girard; Coleman-Shields & Co., Niles; Falcon Iron and Nail Company, Niles; the Hubbard Iron Company, Hubbard; Summers Bros. & Co., Struthers; the Cherry Valley Iron Company, Leetonia; the Spearman Iron Company, Sharpsville Furnace Company, Pierce, Kelley & Co., Claire Furnace Company, Sharpsville; Sharon Iron Company, Perkins & Co., Sharon; the Wheeler Furnace Co., West Middlesex. These concerns include 22 furnace stacks, 13 rolling mills, one pipe works, 1 wash metal plant. The output of pig iron is 1,200,000 tons annually and 450,000 tons of finished iron, while the number of men employed will exceed 20,000. It is the first time in the history of the iron business in Eastern Ohio and Western Pennsylvania that the iron manufacturers have been united. The following officers have been elected to serve for one year: H. O. Bonnell, president; J. G. Butler, Jr., vice-president; H. F. Passavant, secretary and treasurer. Executive Committee: George D. Kelly, of Sharpsville; F. A. Wheeler, George D. Wick, James Neilson, J. G. Butler, Jr., of Youngstown.

The Rosney Iron and Lumber Company, Limited, have been incorporated in Virginia, to build a new manufacturing town in Buckingham County to bear the name of Rosney. The company own 5000 acres of timber and mineral lands in that county. The capital stock has been placed at $1,000,000. The officers of the company are as follows: President, Hon. Frank Shaw; vice-president, Dr. James H Billingslea of Baltimore; managing director, John H. Walter of Washington, D. C.; secretary, H. M. White, Washington, D. C.; treasurer, John L. Reifsnider, Westminister, Md.; attorneys, Charles T. Reifsnider and Edmund W Hubard. The company contemplate the establishment of a steel plant, a charcoal furnace, car-wheel works, tool works, agricultural implement factory and a number of other enterprises. Frank P. Dewey, late curator of mineralogy of the United States National Museum, has reported upon the property. The Rosney company will also establish a large store for the purpose of furnishing hardware materials to newcomers at lowest possible figures in order to thus encourage building.

Experiments have recently been made to ascertain whether it can be confidently stated that oil-hardening and annealing, or some such process, is necessary for steel plates. Messrs. Brown and Messrs. Cammell, the two great Sheffield firms, makers of compound armor, are now satisfied as to this necessity. A 9 inch plate of steel was manufactured and cut into two plates, each 4 feet square. One piece was left untreated and the other was oil-hardened and annealed. They were fired at by the 6-inch gun with Firth steel projectiles weighing 100 pounds. The striking energy of the blow upon the untreated plate was 2389 foot tons, and the energy of the blow upon that which had been treated was 2378.5 foot tons. In the latter case the projectile made an indentation of 10½ inches, so that light was just visible through the center of the bulge at the back of the plate. The projectile rebounded, broken into three pieces. The plate was cracked through, but was whole, and no material was splintered out either at its front or back. In the case of the untreated plate, the shot passed through, and the splintering of the steel around the hole in front of the plate spread over a space of 15 inches across. The splintering around the hole at the back of the plate covered a space of 33 inches across. The plate did not remain whole, but went into six pieces.

NEW PUBLICATIONS.

BUILDING STONE IN NEW YORK. Bulletin No. 10, State Museum. By John C. Smock. Pages 191-400; map, 58 x 60 cm.; table. September, 1890. 40 cents.

The State of New York is peculiarly rich in geological history. Many of its terms have been derived from the numerous localities which furnished great facilities for the study of typical formations and periods of geology. This bulletin is a practical treatise on the building material in these formations. It is arranged in accordance with the order of succession in the geological series and with the accepted classes of rocks—both crystalline and fragmental, with particular attention to the limestones and sandstones, in their several orders of occurrence.

The distinctions in the massive crystalline rocks, such as the granites, gneisses, syenites and feldspars, are not strictly scientific, but of accepted use among builders and architects. The places of their occurrence, as of other building stones, are very clearly and discriminately indicated wherever they have been worked and are accessible. The descriptive notes show a wide and careful observation and judicious use of reports. There is a valuable and interesting section of this bulletin upon the use of stones in New York and other cities in this State, with particular mention of houses and buildings, and of the effects for beauty and utility, which have been critically noted. The importance of scientific tests, the methods and results, are presented, partly in tabulated form and in more easily comprehended ways, by Prof. Francis A. Wilbur of Rutgers College, who personally made collections of all the samples used from quarries in New York, and conducted the tests of these with stones from the most noted localities in other States. These tests have proved the superiority of the better sandstones to the granites, marbles and limestones in their capacity to resist the effects of high temperature—fires—and these latter classes of stone are shown to be unable to withstand the vitrifying and calcining effects of intense heat. Yet they are quite as durable as sandstones under ordinary weather exposure, as shown by the freezing and thawing tests. There are other considerations of appearance, beauty, ease and economy of working, as well as value for fire-proof construction, which are, at times, not less important. The superiority of the best stones from New York quarries over those from other quarry districts in the country, as indicated by these comparetive tests, is thus stated: "New York has within its limits almost inexhaustable deposits of granites, sandstones, limestones and marbles of such superior quality, and for durability some of its sandstones and bluestones are the best in the world. The 'life' of such stones or the length of time which they may last as durable material in buildings cannot be known from the oldest structures, in which they are still almost as fresh and strong as ever"

While the durability of stones is shown to depend greatly on their physical structure and its interstitial spaces, as well as the strength of their chemical constitution, the accident of position in a building is shown to be a more important element of durability than is generally regarded. "Nature is a great teacher, and her object lesson, so easily read, is before us. In building, the horizontal position of the bedded stone is of greatest importance—that is, the stone should be laid on its bed, and not on edge. Improper position in the wall, where it is exposed to the weather, has more to do with the disintegration and decay of building stone than the chemical composition, and in many cases it is more effective than the inherent weakness in its physical structure." In New York and in smaller cities of this State the common practice is to pile the stone up edgewise, making a veneer, as it were, of the stone. The brown stone of Connecticut has been, almost without exception, subjected to the more effective action of the atmospheric agents through this faulty system of erection. The varying nature of the material for any great thickness, and the oblique lamination and cross-bedded structure, so common in sandstones, occasion the exposure of material of unequal hardness, and consequent unequal weathering, when the stone is dressed or smoothed to a plane surface, and is set on edge in the wall, . . . so that the life of our brownstone front scarcely exceeds that of its well-preserved owner.

Steel Works Wages.

A committee of the striking workmen of the Otis Steel Company claim that the following is the scale paid at Pittsburgh:

Position.	No. of men.	Wages per 100 tons.
Metal and spiegel wheeler	8	$1.65
Coke wheeler	2	1.51
Blower	1	2.80
First regulator	1	1.90
Second regulator	1	1.46
First cupola man	1	3.20
Second cupola man	1	2.53
Cupola helpers	3	1.96
Cinder tapper	1	1.60
Cinder snap	1	1.46
Craw shifter	1	1.98
Vessel man	1	3.14
Vessel man's first helper	1	1.98
Vessel man's second helper	1	1.73
Vessel cinder man	4	1.90
Bottom maker	1	2.26
Bottom maker's helpers	2	1.82
Ladle liners	2	2.16
Ladle liner's helper	2	1.46
Pourer	1	3.14
Pit men	10	2.49
Stopple carrier	2	2.36
Mold washer	1	1.36
Mold sanders	2	1.69
Steel rack man	1	1.51
Iron crane man	1	1.46
Steel crane man	2	1.46
Fireman, No. 4 crane	1	1.51
Helpers, No. 4 crane	2	1.46

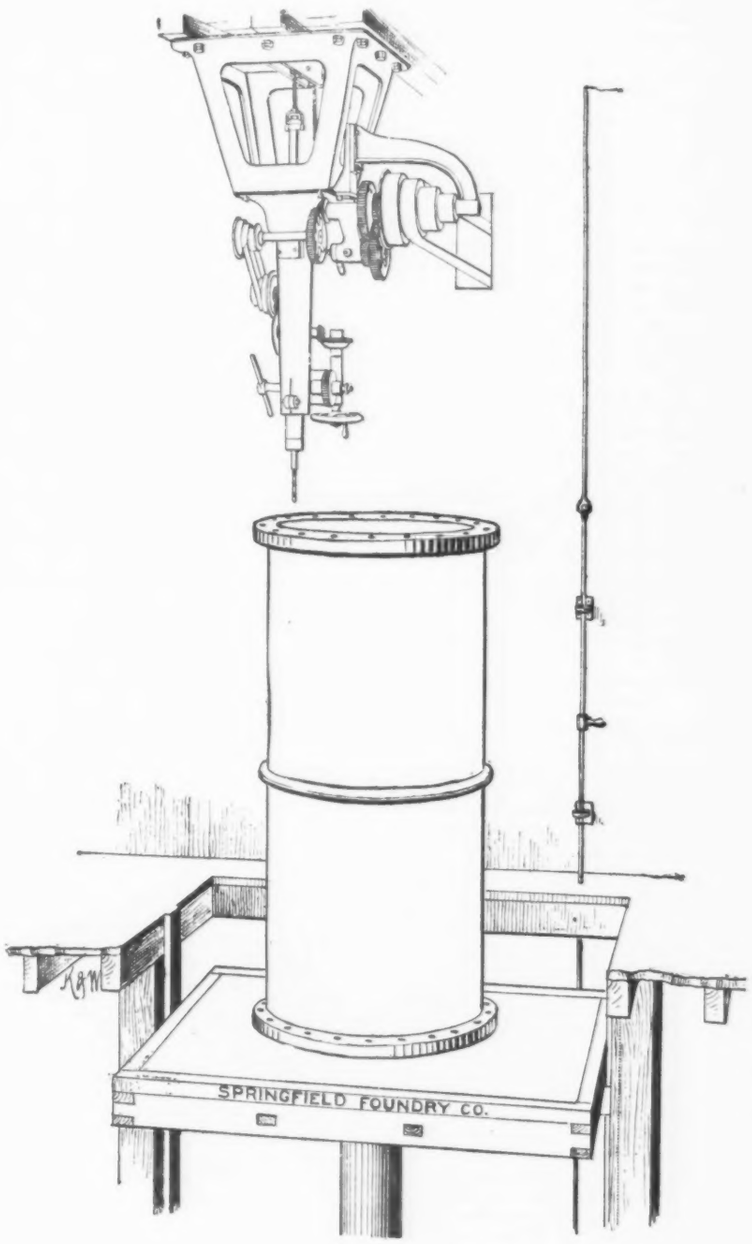
Work is progressing at Roanoke, Va., on the new plant which is being constructed for the Duvall engine works, which will be transferred from Zanesville, Ohio The capital stock of this company is $60,000, and about 60 men will be given employment. The principal articles of manufacture will be water-tube boilers, patent heaters and portable engines.

The total value of the products of the whale fisheries last year was less than $2,000,000, including sperm, whale and bone. A plan is on foot to hunt whales in the Antarctic seas.

The Titan Hydraulic Elevator.

The accompanying engraving shows a convenient adaptation of the hydraulic plunger or direct-acting elevator built by the Springfield Foundry Company of Springfield, Mass. A suspension drill above the elevator platform is so placed that cylinders or other long castings may be adjusted with ease and in the shortest time, without the use of chain hoists, jack screws, blocking, &c., and the considerable amount of labor which the use of such crude appliances often entails. A revolving plate with ball bearings may be placed on the platform to facilitate the bringing of all parts of the work under the drill. The drill when located above the first or second floor allows great latitude of adjustment, and, of course, the elevator can also be used for ordinary lifting purposes. When arranged as shown in the illustration, the elevator answers nearly all the purposes of the radial drill, besides having advantages not possessed by the latter. Another convenient use of this elevator is in the raising of heavy work to the proper level for the lathe or planer, to which the work can easily be transferred by means of skids and rolls.

An important advantage of this style of elevator lies in the fact that it requires no space for guide posts, sheaves, drums, or cables above the upper landing, and even the posts below may be replaced by telescoping guides, so that the entire elevator can be dropped beneath the lower floor completely out of the way when not in use. With this elevator there is not the slightest chance for the platform to fall, no matter if overloaded, as the solid column of water beneath the plunger always supports the load, and can be discharged just as gradually as the operator desires.



THE "TITAN" HYDRAULIC ELEVATOR IN THE MACHINE SHOP.

Arbitration in Massachusetts.

The annual report of the Board of Arbitration and Conciliation of Massachusetts has interest outside the State limits. Its more important portions are these:

"The experience of this board during the past year with controversies which have arisen between employers and their employees has tended to prove more conclusively than ever that strikes and lockouts are expensive methods of dealing with differences of opinion. So far as these methods are productive of any definite result, they seem well calculated to leave behind in the minds of the workingmen a smouldering sense of grievances unredressed, and on the side of the employer a feeling that undue pressure has been exerted at a time when he was least able to withstand it. The strikes which have occurred in this State in the year just ended have been, almost without exception, disastrous to those who embarked in them, and in some instances nearly destructive of the organizations with which the workmen were allied. Employers have learned how to make combinations among themselves, and by so doing to oppose an effective barrier to combinations of labor. By this means, through their greater command of material resources, the aid of combinations of manufacturers has sometimes been invoked for the purpose of crushing labor unions and the claims advanced by them in behalf of the workmen, although the position of the employers, so far as it was just and reasonable, might have been maintained without expense or loss of self-respect, by appealing to this board, and that, too, without any paralysis of business or injury to unoffending men and women not engaged, directly at least, in the controversy.

"Some of the controversies of the year which have attracted much attention have been struggles between associations of employers on the one hand and unions of workmen on the other, when there appeared to be no possible solution except through a struggle which should test the powers of endurance of the respective parties. In cases of this sort which have come under the immediate observation of the board, success has not been on the side of the workmen, and all such experiences have shown, as nothing else could, often too late for any benefit in the particular case, how much trouble and distress might have been averted by pursuing milder methods established by law for hearing and adjusting, so far as possible, all real grievances.

"In contrast with these vain attempts to settle differences by methods calculated to deepen the feelings of hostility on either side, the board has at every opportunity exerted an influence of a totally different kind, seeking to bring the parties together on terms of equality in the presence of an impartial tribunal, and, by removing friction and reducing the causes of difference to a minimum, to effect a settlement under which employers and workmen might resume their natural and normal relations to each other. By this method, the method of reason and conciliation, settlements fairly acceptable to both sides, and highly approved by the general public sentiment, were attained in many cases which at first were obstinate and difficult of approach, notably at Haverhill and Woburn, not to mention others of less importance. In some cases where men, acting from impulse or provocation, have declared a strike, the board has, by inquiry subsequently made, been satisfied that there was some foundation, to say the least, for the complaints made, but, unfortunately, hasty action has produced a state of feeling on one or both sides that was in itself an obstacle to any fair and dispassionate consideration of the grievances alleged. A better course of proceeding—that of making application to the board, without strike or lockout—has invariably met with more satisfactory results.

"But the influence of the board and of the principles of arbitration and concilia-

tion which it represents and applies is not limited to the particular cases which are brought before it and in which it offers advice and renders decisions. The success achieved in Massachusetts by the application of reason and conciliation in the name of the State has attracted attention in other States of the Union, as well as in Europe and Canada. Teachers and students of political economy in our colleges, men engaged in business and the professions, mechanics and men in public life throughout the country, send for the reports issued by the board, and bestow words of encouragement which are highly appreciated, and are not superfluous when the character of the work is considered—difficult and sometimes thankless, and always requiring infinite patience and tact. The practical value of the wage-lists recommended by the board from time to time in the past is evidenced in a noteworthy manner. Not infrequently it happens that some one, it may be a manufacturer, or a workman, perhaps, applies either in person or by letter for a copy of some price-list recommended by the board two or three years ago, saying that a question of prices has arisen in some shop or factory, and on one side or the other it had been urged that a decision of the State Board had in effect settled a fair rate of wages for work like the work in question. It is obviously impossible to estimate the number of cases of this sort in which the careful, painstaking work of the board in the past has supplied a standard which, with proper adjustments to the circumstances of each case, has served to facilitate a settlement of differences by agreement of the parties most interested. It is certain that the work of this board is often referred to in the manner and for the purpose indicated, and there is much reason to believe that the influence of its decisions has in this way been salutary and far reaching."

The yearly earnings of the workmen and workwomen directly affected by the controversies which have been dealt with by the board during the year are estimated at $4,056,195, and the total yearly earnings of the factories involved amount to about $12,044,525. The total expense of maintaining the State Board has been $8109.

British Shipbuilding in the Last Quarter of 1890.—In spite of the fall which took place in freights during the year 1890, and the growing amount of British shipping which has recently been laid up freightless, it appears from Lloyd's returns that there were no fewer than 471 vessels of a gross tonnage of 734,010 tons in course of construction in the United Kingdom at the end of the year. It is true that, as shown in the returns, this tonnage was about 16 per cent. less than at the end of 1889; but, on the other hand, it is greater than at the end of the third quarter of 1890, and, moreover, preparations were being made for the construction of 178 vessels of 293,288 tons, whereas only 136 vessels of 242,041 tons were preparing at the end of September. The returns also state that during the year 1890 the total shipping launched of the United Kingdom comprised 651 steamers of 1,061,619 tons and 92 sailing vessels of 133,086 tons—that is, a total of 743 vessels, with a gross tonnage of 1,194,705.

Joliet (Ill.) business men are much interested in the outcome of a visit recently made to their city by representatives of a large English firm of sheet steel manufacturers, who are prospecting for a site in the West. Of course a tin-plate factory figures as part of the scheme. The visitors are reported to have been favorably impressed with the situation of Joliet.

Casting Solid Ingots.

A very ingenious method for overcoming the trouble of unsound ingots has been proposed and experimented with by William R. Hinsdale of Jersey City, who has been prominent in introducing into this country the Boulton casting apparatus. The patent recently granted to Mr. Hinsdale describes as follows the

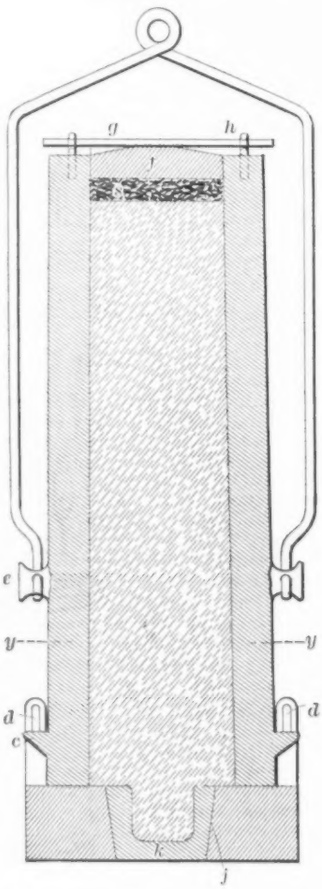


Fig. 1.—Vertical Section Bessemer Mold.

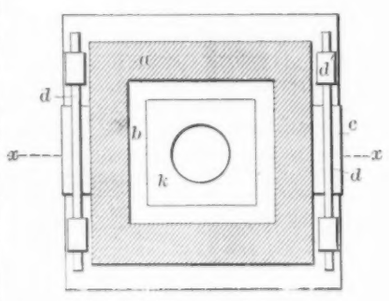


Fig. 2.—Horizontal Section Bessemer Mold.

which to act upon the surfaces of the cavity, and the lack of union between the adjacent surfaces of the cavity when the ingot is rolled into a merchant bar commonly causes a serious defect therein."

Mr. Hinsdale's idea is first to chill the top of the casting and then turn the ingot upside down, before it is solidified. The cavity then forms in the other end of the ingot, where its walls are fully protected against the oxidizing influences of the atmosphere. He arranges his molds in such a manner that the cavity is formed in a stud or projection at one end of the ingot. In order to prevent the metal first poured from hardening too rapidly, he puts a heated cup of refractory material into the bottom of the mold.

The details of the molds themselves are shown in the accompanying engravings. Figs. 1 and 2 indicate how the system is applied to Bessemer-steel molds. The mold is provided with a base connected with the mold by lugs *c* and keys *d*. A tapering hole *j* is shown formed through the base, and a cup *k* formed of fire-brick

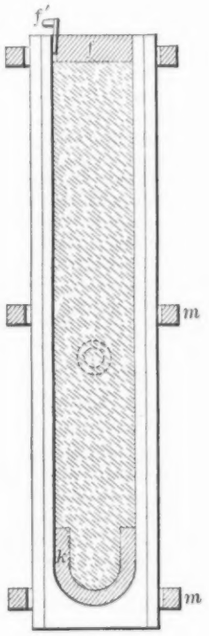


Fig. 3.—Vertical Section Crucible Mold.

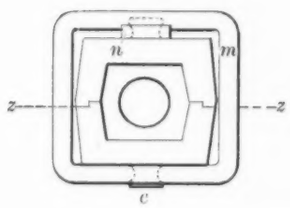


Fig. 4.—Plan Crucible Mold.

CASTING SOLID INGOTS.

occurrences with the present method: "In the formation of cast-steel ingots, especially those containing a large proportion of carbon, it is common for the shrinkage of the metal when poured in an ingot mold to form a cavity or cavities in the upper end of the ingot, and, if such cavity be exposed to the atmosphere, its walls become speedily oxidized and in that condition are incapable of welding closely together. Such oxidation is especially liable to happen where the ingots are stored for some time before using, as the atmosphere in such case has a longer period in material is fitted into it. Moist sand *s* is put on top of the metal under the cap *f*. Trunnions *e* serve in tilting the mold. The cavity forms, after tilting, in the space offered by *k*.

Figs. 3 and 4 show the method as applied to crucible steel-ingots. The cup *k* and the cap *k* perform the same functions.

N. P. Hyndman of 42 Fifth avenue, Pittsburgh, has severed his connection with the H. C. Frick Coke Company, and has become agent for the sale of Hazard wire rope.

THE WEEK.

An industrial training school on Colonel Auchmuty's plan is to be established in Springfield, Mass., in the vacant works of the Bullard Arms Company. Ultimately each trade will be taught by experts, who will work among the apprentices. It is expected that the school will partially support itself by the sale of its finished products. The management hope to add a "school of engineers."

The House Coinage Committee examined Mr. Leach, Director of the Mint, and Edward Atkinson of Massachusetts. Mr. Leach thought that the passage of a free-coinage bill would cause foreign nations to ship silver here, but before these shipments could arrive the alarm would be so great as to cause the withdrawal of gold from the Treasury and the hoarding of it in banks. The immediate effect of free coinage would be a contraction of the currency. Mr. Atkinson declared that free coinage would stop credit, which would stop business.

The number of immigrants who have arrived at the port of New York alone since 1847 approximate 10,000,000, equal to more than one-seventh of the present population of the United States.

The fecundity of the negro race in the Southern States has undergone a marvelous change, if the latest census returns are correct. This showing the New Orleans *Times-Democrat* disputes. As concerns the three States, Alabama, Louisiana and South Carolina, the editor says: "It will be noted that the ratio of increase among the whites is but little below what it was in 1880, when it was 27.9 per cent., against 26.4 per cent. to-day. This falling off is possible when we remember the defects of the census of 1870; but when we come to the negroes, then the difference is glaring, incomprehensible and impossible. An increase of 34.4 per cent. during the previous decade falls to 9.3. . . When Mr. Porter tells us that the negroes have increased during the decade barely one-third as fast as in any previous ten years, he tells us what we cannot believe, however glad we might be to have it true."

The Michigan Training School has 58 students, the School of Mines at Lehigh University 52, and old Columbia 42.

The Canadian Government is fully awake to the importance of unobstructed navigation over that part of the lakes and rivers through which the products of the Dominion pass to the sea. The work of deepening the Beauharnois and Cornwall canals, at an expense of $12,000,000, will soon be begun, and when completed the largest ships on the lakes will be able to reach the Atlantic.

The confederation of South Africa is among probabilities not very remote. The measure by which the first obstacles in the way of it are to be overcome is the making uniform of the law through all the States and Provinces. What is known as the Africander Bond Association aims at the unification of all the States and Colonies with full provision for the maintenance of local autonomy. If this commercial federation could be accomplished, the promoters of the more comprehensive movement entertain the hope that political union would soon follow.

The New York State Assessors' annual report shows that the assessed value of real estate in 1890 was $3,298,323,931, and personal property $385,329,131. This is an increase over 1889 of $116,224,305 real estate, and of personal $31,071,575. Regarding farming lands the report says: "Our investigations during the year verify the statement that there is no improvement in the value of farm lands or in the financial condition of their owners or occupants. Everywhere we are confronted with the statement that farming lands are depreciating, that sales are infrequent, and the industry continually growing less profitable. As is usual throughout the State, the realty bears the burden of taxation, while the owners of mortgages, availing themselves of the benefits of the law relating to exemptions for just debts, seldom sustain an equitable share of the burdens of government."

General Poe has forwarded to Washington the proposals received for excavating and rock blasting on the Hay Lake channel, Soo River. The extent of the channel to be improved is about 6 miles, and the work will cost the Government nearly $2,000,000.

There are in Massachusetts 179 savings banks, with assets amounting to $372,500,000. The increase in deposits last year was $20,869,000, the largest ever known except those of 1870, '71 and '72. The trust companies have over $56,000,000 of deposits.

The total number of freight cars in the United States at the end of 1889 was 1,060,164. Assuming that all those built in in the railroad shops, and that over 23,000 of those built by private works have gone to fill vacant numbers, there would be at the end of 1890 1,135,000 freight cars in the United States.

The Corinth Canal, which will sever the Peloponnessus from the mainland of Greece, is said to be rapidly approaching completion. The canal is 96 feet wide and 36 feet deep and perfectly straight. The total cost is reckoned at $14,000,000. The annual revenues are estimated at $300,000.

The expenditures of Philadelphia are at least commensurate with its growth. In 1880 the total payments were over $14,000,000. In 1890 the total payments exceeded $22,000,000, an increase of nearly $8,000,000 in ten years.

The superb Hudson River driveway, planned by Peter B. Sweeny and others not unknown to fame, is estimated to cost $3,767,902, which amount the city is expected to pay.

The overhead-wire system experienced a total collapse in the recent storm, and conduits are now more popular.

The iron door in the great marble safe of the Manhattan Savings Institution, just completed on Broadway and Bleecker street weighs 8 ton

A Brooklyn man named Keith is said to practically run the Government in Costa Rica. He owns the only railroad and half of the banana plantations.

New York now owns more real estate than at any previous period, and the sum of its assets, carefully computed, amounts to not less than $500,000,000, which is $5 for every one that the city owes, or 500 cents upon the dollar.

Commotion was created in the sugar trade by the receipt of cable despatches stating that 500 tons of granulated sugar had been bought in Germany for shipment to this country, to arrive after April 1, when the new tariff goes into effect on sugar and sugar products. It appears that whenever the price of granulated sugar in this country is advanced more than $\frac{3}{8}$ cent above the price abroad, then foreign sugars will come in, especially while the sugar industry in Germany remains as dull as now

The bill now before Congress providing for a cable between San Francisco and Honolulu and via Samoa to Auckland names as the incorporators of the company William Alvord, Samuel T. Alexander, Charles R. Bishop, Hugh Craig, William H. Dimond and Edward B. Pond of San Francisco; Asabel Bush, James B. Montgomery and David P. Thompson of Oregon; Admiral W. R. Shufeldt and Alfred T. Hartwell. The bill provides that for the term of 15 years the United States shall pay to the company $200,000 per annum, for which consideration all messages of the United States shall be transmitted free, and the Hawaiian Government agrees to grant the company $25,000 per year. The estimated cost of the line is $3,500,000.

A novelty in last week's imports at New York was the arrival of 5000 barrels of creosote from London.

Steamboat owners on the Hudson River have in contemplation a board of arbitration, to whom all questions that arise in the forwarding business shall be submitted, rather than waste money in litigation over trifling matters.

The Interstate Commerce Commission ordered thirteen railroads, among which was the Lehigh Valley and the Baltimore and Ohio, to cease making discriminations against local shipments and in favor of imported goods. The complaint was not sustained as to the Pennsylvania Railroad.

The Reading is arranging to ship coal over the Lehigh Valley to Amboy, pending the building of their own road from Bound Brook to Arthur Kill. This will enable the Reading to ship coal much more speedily than they have been able to do over the New Jersey Central.

With one exception, all the fruit canneries in California will be under control of a corporation, which will be known as the California Fruit Canneries, Limited.

Capitalists interested in ports on Puget Sound are planning to establish a direct steamship line to China and Japan, in opposition to San Francisco.

The new sugar company organized under the laws of New Jersey claim to have made a saving of $65,000 a year in salaries by discharging old employees, one of whom drew $25,000 as treasurer of the Matthiessen concern.

The bills for appropriations introduced in the New York Legislature this session include items amounting to $5,000,000 for State roads.

Immigration into the Argentine Republic, which in 1889 numbered 273,000 arrivals, has been reduced to nothing by a counter movement of those who are leaving the country.

The Mexican Ramie Company, of which the Minister of Public Works is president, and General Sewall of New Orleans is manager, have purchased 600,000 acres of land densely covered with henequin.

The Contract Labor law seems to have had no effect in preventing the importation of cheap labor, as appears from the immigration figures for 1890. Italy sent 62,492 people to America, or more than twice as many as in the year before; Poland sent 19,737, or more than four times the number of the previous year; Bohemia sent three times as many as in 1889; and the immigration from Hungary was very much greater. On the other hand, Switzerland, Great Britain and Ireland and the Netherlands sent a smaller number than usual, while the immigration from Germany, France, Sweden and Norway and Denmark slightly increased. How many skilled artisans have been excluded can only be surmised.

A St. Louis paper says the great majority of the loans now being negotiated on Western and Southern farms and agricultural property are made payable in gold or at a gold valuation.

The Iron Age

New York, Thursday, February 5, 1891.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING. - - - - BUSINESS MANAGER.

Subterranean Rapid Transit.

Views of engineers respecting the practicability of underground communication, whether beneath the bed of rivers or by tunneling under the foundation of great cities, have been radically changed within a comparatively recent date. No works of a subterranean or sub-aqueous description present obstacles too formidable to be undertaken, if not completely overcome. Witness the startling proposal to tunnel the bed of the British Channel all the way from Dover to Calais; Greathead's double-tunnel underground railway actually in operation in London; also the tunnel now in progress beneath the Hudson River; the successful excavation at St. Clair River; Corbin's proposed Staten Island Tunnel, and the contemplated East River Tunnel to Long Island City. Compared with some of these the proposition to tunnel longitudinally through the rock bed that constitutes the foundation of Manhattan Island for rapid-transit purposes is an engineering problem of easy solution, especially now that rock-boring tools are made in such perfection, and motors for underground service are available which do away with smoke and noisome gases.

The recent developments in engineering skill are timely, with reference to the long-vexed question of providing rapid transit for New York City, which just now has reached an eventful crisis. By an act of the New York Legislature, known as the "Stewart bill," which passed both houses last week by a unanimous vote, the entire subject of rapid transit is committed to the decision of a commission, in whom all citizens have confidence and who are invested with extraordinary powers. This commission will immediately proceed to organize a corporation, lay out a route, adopt plans and perform any other duties that may be needful in bringing about the consummation so long desired. Already the existing lines of travel are conjested and there is no time to lose in providing for the wants of a rapidly expanding population. The most encouraging feature is that all restrictions which heretofore have been an insuperable bar to progress are now removed. The route may be either underground or overground. It may be either an elevated line or be on the viaduct system. Full authority is given to make terms with the New York Central or other railway corporations for the extension of their lines to the ferries or other connections, if deemed conducive to the public interests. Even the parks may be crossed underground, and thoroughfares now restricted, such as Broadway and Fifth avenue, may be crossed over. Chairman Steinway of the Rapid Transit Board expresses special satisfaction with the action of the Legislature, and from conversations held is represented as favoring an underground route, although desirous of giving due consideration to any other system offering superior advantages. Altogether, about 40 plans have been submitted, and in the general survey he pronounced "the viaduct road, with its four solid tracks, away up in the fresh air and light," the ideal scheme. But for such a work there is only one route available; and, besides, the proposition to build on private property and in the center of blocks involves enormous expense and the certainty of protracted litigation. Mr. Steinway is favorably impressed with Mr. Greathead's plan for a metal tunnel constructed of segmental cast-iron rings 1½ inches thick, bolted and riveted together on the inside. He also thinks well of Mr. Corbin's plan for a brick tunnel, but doubts whether it could be relied on to exclude moisture. Arrangements have been made to obtain full information respecting the operation of the metal tunnel in London, as regards air, dampness, &c.

The fact is recognized that the engineering problems involved have been vastly simplified by the experience recently acquired in the prosecution of important works, so that at the present day projects are entered upon without hesitation which a few years ago would have been pronounced chimerical. Very much has been demonstrated in the practice of engineers employed in building the Croton Aqueduct and Hudson River Tunnel, without going further in search of signal triumphs in the engineering art. Valuable facts have been ascertained through the instrumentality of Austin Corbin, whose plans for tunneling under Manhattan Island through solid rock have been approved by so eminent an authority as Gen. John Newton, though prepared originally by Charles M. Jacobs, an engineer connected with the London Deep Tunnel Railway, now in progress. As explained, one great advantage of this deep-tunnel system is that it would occupy no space that was valuable for any other purpose, and would cost nothing for right of way. Except for surface stations at the elevators no private property would have to be acquired and none would be interfered with. There would be no disturbance of the foundations of buildings or of the underground constructions of sewers, water and gas pipes, or electric-wire subways. In the work of construction there would be no interference with pavements except at certain points where vertical shafts would be required.

Mr. Jacobs, in his report of investigations of the various borings taken in the City of New York, says rock is found 43 feet below the surface near the Battery, and ranges about 65 feet below until near Fourteenth street, where it rises to the surface and frequently crops out as far up as 155th street, but the average may be taken as 23 feet. "The character of the borings," he concludes, "is quite favorable for tunneling operations, and its geological condition is partially decomposed granite and gneiss." Thus a very interesting prospect is opened, serving to indicate the means by which in future years the great commercial center of the nation may be made readily accessible from the remotest boundary.

Trade Relations With Canada.

There seems to be no room for doubt that the Liberal party in Canada are preparing to go into the election next month in the expectation of overthrowing the Conservatives now in power on the single issue of trade reciprocity with the United States—not restricted reciprocity, confined to an exchange of natural products, but reciprocity in its broadest sense. True, the Government organ pronounces this notion "palpably absurd." The Conservatives, we are told, do not approve the principle of a zollverein or customs union, nor any arrangement involving discriminatory duties against the mother country, but it concedes, perhaps under pressure, that it would welcome overtures looking toward "a large and liberal measure of reciprocity of trade."

Sir Richard Cartwright, who expects to head the new administration, if successful at the polls, in a speech delivered at Boston last week, expressed himself fully in accord with what he understands to be New England sentiment upon this subject, saying: "We entertain no idle visions of political reunion or of a vast Anglo-Saxon empire, but we do think that on certain conditions and for certain common objects a firm and cordial alliance might well be created, . . . and we have further ventured to hope that the peculiar position of Canada, especially if close trade relations were established between her and you, might enable her to play some part in bringing about this consummation." In the view of Mr. Cartwright, and of his intimate associate, J. W. Longley of Nova Scotia, who spoke on the same occasion, success in the coming struggle at the hustings in Canada will at once open the way for the settlement not only of the fishery and Behring Sea questions, but of all outstanding troubles.

Sir John Macdonald, speaking for the Dominion Government, is not of this mind. On the contrary, he is apprehensive of the ultimate results of closer commercial relations, as defined in Hitt's resolution, now pending in Congress "Given the promises of commercial union," so says the ministerial organ, "and the conclusion of annexation certainly cannot long be delayed." Again, "Americans should understand that the political independence of Canada will not be bartered for their market." In the light of these facts the contradictory reports, lately circulated, respecting alleged conferences at Washington may be given their proper weight. Doubtless the Liberals would gain a strong point if they could go to the hustings fully assured that success would

remove even in a degree existing trade restrictions from which Canadians are suffering severely, however much they may desire to conceal the fact. New England, however, will be satisfied with no "jug-handle arrangement." Says the Boston *Commercial Bulletin:* "A measure of full reciprocity providing for the free exchange of all products, both natural and manufactured, while at the same time Canada continued her tariff on English and foreign manufactured goods, would open up vast possibilities of trade between the countries." Likewise the Springfield *Republican:* "We want in Canada a market for our manufactures and our wares of all kinds, where we can go upon equal terms with Canadians themselves." And the Boston *Traveler:* "With few exceptions, the recognized organs of public opinion have already pronounced themselves in favor of complete reciprocity and, although action at Washington has not in all respects reflected New England opinion, it is probable that, if the opportunity served, little trouble would be experienced in shaping national policy in this respect into conformity with New England's wishes."

But their is another point vital to the whole matter—namely, would the Imperial Government permit Canada to open her markets to American manufactures? Would discrimination against the mother country in this respect be tolerated? We think not.

The Western hardware jobbers are annoyed to some extent by the new railroad regulations regarding carload rates, which became operative on the 2d inst. These regulations have been previously alluded to in our columns, but at that time it was not known that they would be rigidly enforced. It now appears that they are to be strictly carried out, and hereafter mixed carloads of goods, even though they closely assimilate in character, will not be billed at carload rates. In order to secure such rates the contents of a car must be of one kind of goods. It has long been the custom of the Western hardware trade, under permission of the railroads, to ship mixed carloads of barb wire and nails, for instance, thus enabling retail merchants to purchase stock in moderate quantities and have it delivered at carload rates. Not many retail merchants enjoy a trade so large that they can handle straight carload lots of even staple goods, but a very large part of them can handle half carloads, and the trade in such quantities has grown to large proportions. The change in the railroad regulations amounts to a considerable advance in freight rates to this class of business men and will be perceptibly felt by them, unless they change the character of their orders and purchase carloads instead of half carloads of these goods. This will, of course, entail the danger of overstocking, which prudent men will usually avoid. If, however, purchases of carload quantities become customary with the retail trade, the question arises as to how long the jobbers will be permitted to control it. In other words, the chances are that manufacturers would then cultivate a wider field among the retail hardware merchants than they now cover.

Machine Shops and Tools.

In is the dream of every machine builder who has grown with an expanding business to some day be able to erect a works which shall faithfully represent the ideas he has formed of what a shop should be. He began to plan when he first discovered a defect in his present shop. His design grew from time to time as his lack of conveniences became evident and as he learned of the introduction of new appliances, or found that his neighbor was producing better work at a cheaper rate. Many times he though his plans perfected, as they followed the latest and best patterns as far as the building was concerned, and as the equipment contained the most perfect devices intended to expedite work. Just as many times has he altered his plans, being compelled to do so by the advent of some more advanced idea. He thinks his plans are now in perfect shape, and he would like to break ground for a model building. Let him wait a month, and the chances are that he will find it necessary to essentially modify his ideas.

A shop intended to economically and expeditiously turn out a certain line of work can be erected and equipped today, and it will be in accordance in every respect with the best practice on that date. Therefore, it will be perfect when gauged according to present standards. But that same shop will have to be altered to-morrow if it is to conform to the latest practice. If all advance in the mechanical world were to cease, then we should soon have perfect shops only. But as long as improvements are hourly made to facilitate the handling of material in every branch of every industry, just so long will it be impossible to have perfection. So rapid is the march of progress that we have no doubt it is now absolutely impracticable to establish a plant which shall, for even a short time, be known to contain all the best appliances on the market.

Some time since a shop was built to satisfy the dream of its designer—a man of long experience in the business, having an intimate acquaintance with every detail and requirement, and most essential, having all the capital needed to truthfully execute his scheme. A visit to the works before they were fully occupied elicited the remark that if he had the same thing to do over again he would make some changes. That might have been an error in judgment, but it does not affect the statement concerning the perfection aimed at. A few days since we were informed by the proprietor of a mammoth establishment that had a certain appliance been on the market when his designs were made and contracts let he would have substituted it for the one he did put it. This shows an advance made between the time of designing and executing. These illustrations only emphasize the fact that the march is so rapid that it is difficult to keep step.

The life of tools and of plant in machine shops is certainly far longer than their term of utility. It has long ceased to be profitable or safe to attempt to exhaust the vitality of machinery. It is antiquated before it is old, and must wander to the scrap-heap to make room for more efficient and therefore necessary appliances. Ingenuity may, by modifications, give a new though brief lease of life, but those are sure to steadily fall back to the rear who cannot face the hardship of condemning plant which seems to have in it the capacity for much useful work.

Our achievement of having distanced Great Britain as a pig iron producer cannot be more strikingly shown than it is in the chart which we publish in this issue of *The Iron Age.* From a production of less than 1,000,000 net tons, in 1860, when Great Britain was making more than four times that quantity, we have reached 10,307,028 net tons, in 1890, eclipsing our rival's best record in 1882 of 9,617,082 net tons. Last year, according to estimates by good authorities, we made only 8,850,000 net tons. We have also added two lines, showing how rapidly we outstripped Great Britain in the manufacture of steel.

PERSONAL.

Thomas Bailey, who has been agent of the Athens Iron Foundry for many years, has resigned that position.

F. C. Fladd, who has been connected for many years with the Stiles & Parker Press Company, and who for the past five years has been the manager of their New York department, has accepted the position of assistant superintendent of the E. W. Bliss Company, Limited, of 17 Adams street, Brooklyn, N. Y.

William Morris, for some time superintendent of one of the departments of the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., has been made general superintendent of the plant of the Allegheny Bessemer Steel Works, at Duquesne, Pa.

OBITUARY.

CHARLES B. NORTON.

In the death of Gen. Charles B. Norton, which occurred at Chicago on the 29th ult., a prominent figure in connection with international expositions has passed away. General Norton was born at Hartford, Conn., on July 1, 1825, and in early life was engaged in the book publishing business in Boston and New York. When the Civil War broke out he recruited a regiment in New York, the Garibaldi Zouaves, who served throughout the entire war. The general became an aid to Gen. Fitz John Porter, and formed a strong personal friendship with Generals Grant and McClellan, with whom he was a great favorite. He made a thorough study of international expositions and was universally looked up to as an authority on matters appertaining thereto. He was a Government agent to the London Exposition of 1851 and American Commissioner to the Paris Exposition of 1868. He was intimately associated with the management of the Philadelphia Centennial of 1876, and recently went to Chicago as an advisory aid to Director-General Davis, who intended to appoint him historian

of the fair. One of General Norton's latest labors, a publication entitled "World's Fairs from 1851 to 1893," has recently been published, and was reviewed in our columns.

ISAAC MYGATT.

Isaac Mygatt, who was buried at Coxsackie, N. Y., February 2, was a prominent citizen of that place. He was once superintendent of the Malleable and Gray Iron Company. Mr. Mygatt was born at Chesterfield, Albany County, N. Y., in 1820. He had been active in business for over 40 years. He was largely engaged in the lumber and coal business. At the time of his death he was a director of the National Bank of Coxsackie. His death will be a great loss to several business interests.

Correspondence.

Rail Mill Capacity.

To the Editor: The editorial statement in *The Iron Age* of January 29 concerning the possible output of the steel rail mills is, I think, likely to give a wrong impression of the capacity of these works. After showing that the estimated capacity of the seven large companies that now produce nearly the whole output is 2,600,000 tons (whether net or gross tons is not stated), and that the shipments in 1890 of rails weighing more than 56 pounds per yard were only 1,388,186 gross tons, the editorial concludes, "We feel convinced from a knowledge of the work done at different establishments, if pushed, that the possible output is not over 2,000,000 gross tons."

The fact is that this "possible output" was actually exceeded as long ago as 1887, when the steel rail product was 2,373,335 net tons, or 2,119,945 gross tons. The product in 1888 was only 1,390,975 gross tons, and in 1889 1,513,045 gross tons, due to the decline in railroad building since 1887; but as the rail mills have been improving their equipment ever since that date, it is more than likely that their capacity is now greater than it was in that year.

The estimated capacity of the seven companies given in the editorial as 2,600,000 tons is obtained from the figures given in Mr. Swank's Directory of Iron and Steel Works, of the date of November, 1889, and the figures are net tons. It does not include the capacity of the Troy, Cleveland, St. Louis and Pueblo Works, which is not less than 350,000 tons, nor take any account of the improvements in rail mills since 1889 or of the new works of the Pennsylvania Steel Company, at Sparrow's Point. If these are taken into consideration there is scarcely any doubt that "if pushed" the steel rail mills have a possible capacity of over 3,000,000 gross tons, instead of 2,000,000. W. K.

We did not, in the editorial note referred to by our correspondent, state that 2,000,000 gross tons represents the steel rail capacity of the whole country, but protested against the rated capacity of the works named. The 1887 product to which our correspondent refers included the make of works which have practically abandoned the manufacture of rails—viz., Troy, Cleveland and St. Louis—and may be considered now as producers of soft stock solely. The new works of the Pennsylvania Steel Company, which are still far from being completed, cannot be considered a factor in the matter yet. It must be noted, furthermore, that some of the other concerns rated as rail mills are really turning their Bessemers metal into billets and rods, from which they would not turn unless there were an extraordinary difference in the market for rails and soft steel.—EDITOR *The Iron Age.*

Reform in Railroad Management.

To the Editor: The impending action of Congress in the matter of free coinage of silver has temporarily diverted the attention of financiers, economists and the public generally from the question of reformation in certain matters pertaining to the management of our railway properties, which, with proper care, are destined to become the most approved form of investment in this country. A return to a consideration of this question is imminent, however. In this connection I take the liberty of calling your attention to a contribution on that subject, by myself, which appeared in the *Sun* of 12th inst.—copy of article inclosed—and would particularly direct you to the points marked therein.

My contention is, 1, with reference to "stock watering," that it has no effect whatever in raising rates, that the latter question is governed wholly by natural causes over which individuals nave no control; 2, that the Interstate Commerce law, bad as it is in its present shape, might by intelligent and concerted action be availed of as a means of escape from the demoralizing and repressive legislation of the West; that by securing wise amendments based somewhat on the lines of the better features of the State Commission laws of Massachusetts and New York many evils that now harass the railway interest, such as indiscriminate rate cutting, unnecessary construction, &c., might be remedied, if not wholly removed; 3, that the new Presidents' Agreement will be largely abortive, due to the animosity it is sure to create throughout the Farmers' Alliance States, wherein it is now viewed as being without the pale of law; 4, that no new lines should be built under sanction of law except under contract with the counties benefited by such, guaranteeing interest on actual cost for a reasonable period and immunity from competition for a corresponding period; 5, that all inside cliques, whether of directors, officers or employees, which subordinate the interest of security holders to private gain should be rooted out and crushed under the heel of popular condemnation.

These are radical propositions, but I think that they strike more nearly at the root of the evil than do the temporizing expedients of the Western Association. The latest example of proposed legislation is that in Minnesota; it goes to show to what extremes demagogic legislators may proceed in order to curry favor with a class who presumably have a preponderating influence in their several constituencies. The interests of railway shareholders and bondholders should be conserved at least to an extent in conformity with prevailing common sense—not Western sense, however, but the matured common sense of the sections of the country east of the Mississippi and north of the Ohio.

Many of the evils with which the railway (and incidentally the financial) interest is beset are chargeable to what is termed railroad bookkeeping. A table showing the fluctuations of railroad stocks during the recent panic, which I prepared for the Boston *Herald*, showed that the 85 railroad companies whose stocks are included therein have an aggregate mileage (excluding all leased and operated lines) of 83,464.15 miles, or about one half the total mileage of the country. The total par value of their stocks is $1,948,690,400; of all railroad stocks on the New York Stock Exchange, $2,049,608,260. On May 27, 1890, the average market price per share ($100) of the aforementioned $1,948,690,400 was 60.05, which average was an advance of 7.57 per cent. from the lowest prices recorded earlier in the year. On this basis these stocks were valued in the market at $1,179,314,240. During the recent panic the decline averaged 16.78 per cent. per share, reducing the average valuation to 43.27 per cent., at which price the securities mentioned were valued at $843,198,336. In view of this showing it is safe to assume that the market valuation of the entire $4,500,000,000 railroad stock in existence (including, but taking into consideration, the duplicated stock having only a nominal value) would not average more than $30 per share, or say $1,350,000,000 in all, and this is perhaps a reasonable estimate of the average value if the aggregate of dividends paid be any criterion of value.

JNO. P. MEANY,
Managing Editor Poor's Manual of Railroads.

NEW YORK, January 30, 1891.

The Coke Situation.

The recent conference between the coke operators and workers of the Connellsville region was held at Scottdale, Pa., on Monday, the 2d inst., but no settlement of the impending strike of the workmen was effected. The Conference Committee appointed by the operators presented the following proposition to the Scale Committee of the workmen:

We hereby demand a 10 per cent. reduction on all classes and kinds of labor and level full wagons on tipples from the rates paid in the agreement which will expire February 10, 1891. The justice and equity of this demanded reduction will be apparent to your committee and the workmen when they take into consideration the present condition of the coke trade, as well as the future outlook for the year 1891.

The committee to whom this proposition was made absolutely refused to consider it, and took occasion to inform the operators that the workmen would insist on having a material advance in wages instead of a reduction. They further stated that they did not agree with the views of the operators in regard to the gloomy outlook for the future, and they further believed that a decided improvement in business will soon take place, and that their request for an advance in wages was fully justified. The operators presented their idea of the question by showing why a reduction in wages should be made instead of an advance. They stated that the outlook for the coke trade was discouraging, that the iron industry, on which it was wholly dependent, was in an unsatisfactory condition, and in view of the present depression the workmen should, in a spirit of justice, agree to a reduction of 10 per cent. The question was discussed at some length, but neither side would withdraw from their original position. It was finally decided to adjourn and hold another conference during the present week. It is the impression that a settlement of the threatened trouble will be effected before the expiration of the present agreement. From the fact that many of the workmen have had but little work recently, owing to the closing down of so many ovens in the region, there is little doubt but that they would much prefer to have a settlement of the question without recourse to a strike. A compromise of the matter during the present week is not at all improbable.

The puddlers of the Brooke Iron Company at Birdsboro, Pa., and of the Ellis & Lessig Steel and Iron Company of Pottstown, Pa., have struck against a reduction of wages from $3.75 to $3.50. Both are cut nail mills

MANUFACTURING.

Iron and Steel.

It is reported that Ralph J. Wick, a well-known iron manufacturer of Youngstown, Ohio, has leased a rolling mill at Trinidad, Col., and will put it in operation within 60 days. It is also stated that Mr. Wick has secured an option on the plant that will allow him to purchase it within a year, should he desire to do so.

President H. F. DeBardeleben on the 20th ult. issued orders to his general superintendent, L. W. Johns, to blow in at once one of the Oxmoor furnaces and to get the other one ready. No. 1 Furnace will be put in blast in a few days, of which due notice will be given. No. 2 Furnace will be in blast 10 or 15 days later.

The extensive pipe concern of St. Louis, Mo., Shickle, Harrison & Howard, have been busily engaged erecting branch works at Bessemer, Ala., which are now reaching completion so far as to have present capacity of turning out 200 tons of pipe per day. The arrangements have been made to add to the present buildings, so as to increase the capacity to 800 tons daily. Ground was only broken last September, and by the middle of February they expect to be turning out pipe which go on orders already booked. It is claimed that pipe can be made at Bessemer and shipped to St. Louis cheaper than the pig iron can be shipped from the South to St. Louis on a $3.25-per-ton freight rate and manufactured into pipe there.

There is a small pipe works now under construction at Fell City, Ala., located at the intersection of the Georgia Pacific and East and West railroads.

An erroneous report is in circulation in the West regarding the Ætna Iron and Steel Company of Bridgeport, Ohio. It is asserted that the company have concluded to abandon the manufacture of bar iron, with the intention of making a specialty of sheets and plates. We are advised that not only is this report incorrect, but that on the contrary the company propose to greatly increase their capacity for the manufacture of bar iron.

The Cleveland Rolling Mill Company of Cleveland, Ohio, have decided to make a number of important improvements at their plant. With this in view they have placed an order for a pair of blooming mill engines with cylinders 34 x 48 inches and hydraulic reversing gear. William Tod & Co. of Youngstown, Ohio, secured the order.

The blast furnace of the Belmont Nail Company, at Wheeling, W. Va., has been blown out for an indefinite period on account of the depressed condition of the iron trade. This furnace has had a noteworthy run, having been in blast three years and six months, lacking only a few days. During that time the furnace turned out 125,000 tons of Bessemer pig iron, and has been stopped but four and a half days for the want of material, and from January 14, 1890, to January 10, 1891, was idle for all causes less than 60 hours. The Belmont Nail Company have about 10,000 tons of pig iron on hand, which will be sufficient to meet all their wants for some time to come.

A press dispatch from Wheeling, W. Va., under date of the 28th ult., says: "The Moundsville Mining and Mfg. Company to-day completed negotiations for the purchase of 2000 acres of land in and about the suburbs of Moundsville, paying over $400,000 for it. A company will plant the land and immediately begin its development. Rolling mills will be erected and other manufacturing plants, employing some 2000 men. Officials of the Baltimore and Ohio Railroad and local capitalists are largely interested in the enterprise."

The Brier Hill Iron and Coal Company of Youngstown, Ohio, whose blast furnaces are located at Brier Hill, have just completed the erection of an electric-light plant, and have commenced work on their new casting house.

Riter & Conley of Pittsburgh have received the contract for the erection of the No. 2 Swede furnace for Richard Heckscher & Sons of Swedeland, Pa. The furnace will be 15½ x 80 feet, and the contract includes all pipe work connected with it.

The blast furnace, rolling mill and ore properties of the Valentine Ore Land Association, at Bellefonte, Pa., were sold on the 29th ult., at an adjourned sheriff's sale, under a foreclosure of the mortgage by the bondholders. It was sold in two lots. The first lot, consisting of the furnaces and rolling mill properties, was sold for $100,000, and the second, consisting of the real estate and ore properties, brought $95,000. Both were bid in by J. M. Gephart of the firm of Gephart, Beaver & Dale for the Fidelity Trust and Safe Deposit Company of Philadelphia. These were the properties formerly operated by the Center Iron Company, who failed not long ago. The mortgage bonds were for $600,000 with $70,000 accrued interest. The works will probably be started soon by the bondholders.

On Saturday, the 31st ult., the blast furnace of the Bellefonte Furnace Company at Bellefonte, Pa., and four ore mines belonging to the firm were closed down for an indefinite period. The company claim they were forced to take this action on account of the increase of freight rates on coal and coke made by the Pennsylvania Railroad Company, on whose line they receive all their supplies. About 700 men are thrown out of employment.

The puddling department of the plant of the Mahoning Valley Iron Company at Youngstown, Ohio, is idle at present on account of a strike of the puddlers. They claimed that the iron furnished them was so hard that they could not make a heat in the ordinary time required.

J. W. Britton of Cleveland, Ohio, announces that he has withdrawn from the Britton Iron and Steel Company, and that there have been formed a new company under the name of the Britton Rolling Mill Company, which will make a specialty of soft steel sheets. The galvanizing and tin-plate works will be in operation on August 1, 1891.

The Alabama Iron and Steel Company, with a capital stock of $10,000,000, have petitioned the Alabama Legislature for incorporation. Caldwell Bradshaw and others are the incorporators. They propose erecting a large plant near Birmingham, Ala.

It is stated that a contract has been entered into with the Union Steel Works of Louisville, Ky., manufacturers of edge tools, to locate their plant in Lexington, Va., at as early a day as possible. This company have a capital stock of $1,000,000, and the buildings will cover 4 acres of ground. They agree to work 300 skilled laborers.

The stockholders of the Fort Payne Rolling Mill Company on February 18 will meet at Fort Payne, Ala., to decide the question of issuing bonds.

The Woodcock Iron Works, with $20,000 capital stock, have been incorporated at Goshen, Va.

The work of construction on the new Dora Furnace at Pulaski, Va., is progressing steadily.

The Roanoke Iron Company held their annual meeting of stockholders at Roanoke, Va., on February 2.

The American Bridge Company of Roanoke, Va., have been awarded a contract to erect the rolling mill of the Shenandoah Company at Shenandoah, Va.

Announcement has been made of the sale of the Swede Furnace by the Philadelphia and Reading Coal and Iron Company to R. Heckscher & Sons of Philadelphia. The purchasers have successfully operated the furnace under lease for some years.

Joanna Furnace, at Joanna, Berks County, Pa., shut down on the 29th ult., owing to a scarcity of ore and charcoal.

Neshannock Furnace of the Crawford Iron and Steel Company, at New Castle, Pa., has blown out after a run of 90 weeks.

At a regular meeting of the stockholders of the Carbon Iron and Pipe Mfg. Company, Limited, of Mauch Chunk, Pa., the following Board of Directors was chosen: Dennis Bauman and George W. Bauman, Parryville; Solomon Boyer, Allentown; Amos Dinkey, Easton; C. O. Skeer, George Ruddle and Edgar Twinning, Mauch Chunk. The board subsequently organized by electing Dennis Bauman president and George Ruddle secretary and treasurer.

Paris Haldeman, for 40 years closely identified with Chickies Iron Company, at Chickies, Pa., is about to retire from active business. The business will be continued by the remaining partners, Horace L. Haldeman of Chickies and Henry Grubb of Burlington, N. J., under the style of Haldeman, Grubb & Co.

The Charlotte Furnace of the Charlotte Iron Works, at Rochester, N. Y., after a continuous blast of nearly three years, has been blown out for the purpose of relining the stack and carrying out other repairs and improvements.

A dispute recently arose between the Dunbar Furnace Company and the Dunbar Sand and Stone Company, both of Dunbar, Pa., over a railroad siding which is used by both parties. The stone company attempted to tear up the furnace company's main track, and it was necessary to call on the Sherrif's posse to prevent serious trouble. At last accounts both factions were guarding the property in dispute, with no indication of a speedy adjustment of the trouble.

The stockholders of the Roane Iron Company, Chattanooga, Tenn., have elected the following Board of Directors, to serve one year: H. S. Chamberlain, D. E. Rees, T. G. Montague, C. M. McGree, A. S. Hewitt, W. E. Rockwood, C. R. Forsyth, C. W. Vinson, W. E. Rule, C. M. McClung and Samuel Thomas. The officers of the past year were re-elected.

No. 1 Furnace of the Troy Steel and Iron Company, Troy, N. Y., is being dried out preparatory to going into blast: No. 2 has been producing for some time, while No. 3 is idle.

Port Henry Furnace, at Port Henry, N. Y., is out of blast undergoing necessary repairs to lining and engines.

Three new 15-ton converters for the Edgar Thomson Steel Works, Bessemer Station, Pittsburgh, are on the ground, and preparations are being made for putting them in position.

The Wellman Iron and Steel Company of Chester, Pa., will erect a steel foundry department 100 x 300 feet.

Suit has been brought against McCracken & Semple by the Allegheny Bessemer Steel Company of Duquesne, Pa., to recover $38,920.96, the value of 1500 gross tons of rails, which the plaintiffs allege they manufactured for the defendants, and which the latter refused to either remove or pay for.

It is authoritatively announced that the new charcoal furnace of the Lone Star Iron Company, at Jefferson, Texas, will be lighted on the 10th inst. The stack is 60 x 12, with closed top and two Durham iron stoves, and will use local hematite and limonite ores, producing car-wheel pig.

Four new puddling furnaces have recently been added to the plant of the Belmont Nail Company, at Wheeling, W. Va., making the total number 18. This concern recently re-elected their old Board of Directors, consisting of A. W. Kelly, Joseph Bell, W. F. Stifel, Thomas O'Brien, George G. Hannan, Edward Reid and John G. Hoffman.

The report that the Bellaire Nail Works of Bellaire, Ohio, had taken an active part in a movement to break the rule by which railroad companies charge $1 per car for each car not unloaded within 24 hours after its arrival is without foundation. The above concern have no connection with the movement whatever.

The two new coke furnaces of the Woodstock Company, at Anniston, reported recently as about to fire up, still remain idle, with indecision as yet as to their starting. They are receiving coke from the Blockton ovens. The number of returning strikers to the mines and the increased output of coal will doubtless influence the matter.

The Thomas Furnaces, located between Birmingham and Ensley City, Ala., that depend upon the Pratt Mines of the Tennessee Coal, Iron and Railway Company for the coal from which they make their own coke, and who were the first to close down when the miners' strike commenced last December, blew in their Thomas No. 2 stack January 27. No. 1 will follow suit in a few days.

We understand that the large foundry in connection with the Great Western Iron and Steel Works of Kirkland, Wash., referred to in *The Iron Age* of January 15, is supplied with a colliau cupola furnace, manufactured by Bryam & Co. of Detroit, Mich.

In addition to the extensive plant already in operation at Sparrow's Point, Baltimore, and at Steelton, Pa., the Pennsylvania Steel Company are making important additions to their works at the last-mentioned place. The frog, switch and signal department, under the able management of George W. Parsons, which now employs about 300 hands, is to have its capacity about doubled, the present facilities being quite inadequate to meet the growing demand for their specialties. The company have also recently started a bridge and structural department, which has been placed under the management of Charles E. Billin, who until recently was in charge of a similar business at the Pencoyd Iron Works. Several large orders have recently been secured, and with the superior facilities at the command of the company this branch ought to be a valuable auxiliary to their steel trade. The number of employees in the various departments at Steelton now aggregates about 5000, which will be increased when the additions to the works are completed.

Machinery.

The Dover (N. H.) works of the Somersworth Machine Company have been engaged since June last in the manufacture of coal-cutting machines of a new and improved style for the Thomson-Houston Motor Company.

Henderson Brothers of Waterbury, Conn., have issued a catalogue fully describing the many forms of tumbling barrels built by them.

The business of the E. Horton & Son Company, Windsor Locks, Conn., manufacturers of the Horton lathe chuck, has increased so rapidly within the last year that it has become

necessary to enlarge quite extensively, and with this end in view they have bought out the entire business of A. W. Converse & Co., whose premises join their own, and who have been doing a foundry and machine business. This acquisition more than doubles the capacity of the chuck company, and will enable them to erect another shop for the manufacture of their specialties as large again as the one they now occupy. They will use the foundry for making their own castings. This firm make nothing but lathe chucks, and their list shows a greater variety of styles and sizes than any other manufacturer in this line in the world. They sell their productions in every civilized country. The officers of the company are: J. H. Hayden, president; E. B. Bailey, secretary, treasurer and manager.

The Pratt & Whitney Mfg. Company have broken ground for a new building 300 feet long and 45 feet wide, containing two floors and a basement. This will contain their tap and die department. Last year they were extremely busy with their standard machines, running night and day throughout the year, and the business outlook at the present time is considered very favorable.

The Ball Engine Company of Erie, Pa., claim the exclusive right to make the improved Ball engine. A large new foundry has just been completed, and the plans are prepared for an extensive addition to the plant, on which work will commence on the 15th of this month. The additions will be equipped with modern tools, some of them being specially designed for the class of work. Special appliances will be put in for handling the largest engines. C. W. Laurie, the supervising engineer, will embody a number of improvements in the engines to be built.

The annual meeting of the stockholders of the Standard Underground Cable Company of Pittsburgh was held in that city last week. George Westinghouse, Jr., was re-elected president, and the following Board of Directors was chosen: George Westinghouse, Jr., Mark W. Watson, John H. Dalzell, Robert Pitcairn, Jos. W. Marsh, James H. Willock, H. S. Sweitzer. The annual report of the Board of Directors showed that the company's business for the year 1890 amounted to $917,946.62, representing an increase of 50 per cent. over the business done in the year 1889. The net earnings for the year 1890 were $204,913.78, or a little over 20 per cent. on the capital stock. Two dividends aggregating $30,000 were paid during the year, leaving the net addition to the surplus account $174,913.78. The company's net surplus on December 31, 1890, was $315,735.85. The raw materials used by the company during the year were as follows: 342,549 pounds of cotton and jute yarns; 1,625,209 pounds of copper wire; 1,858,598 pounds of lead.

The architectural iron works of Cheney & Hewlett, at Newtown, L. I., have assigned.

Ground has been broken at Jackson, Mich., for the buildings for the new Columbia Foundry Company.

The new foundry of Houston, Stanwood & Gamble, at Covington, Ky., for the manufacture of Standard slide-valve engines, has commenced operations, and in a year's time they expect to be able to turn out 200 engines of 50 horse-power per annum.

The Monitor Mfg. Company of Aurora, Ill., having a paid-up capital of $100,000, is in the hands of the sheriff.

Wm. Stevenson, a foundryman of Petrolia, Ontario, is in financial difficulties, his liabilities aggregating $60,000.

It is announced that the Illinois Central Railroad will replace their shops recently destroyed by fire at Water Valley, Miss. The main structure will be 286 x 110 feet, of brick, and will be thoroughly modern in every detail.

The Toledo Malleable Iron Works of Toledo, Ohio, which have been in course of construction for some months, have started up with a force of 125 men. This force will be increased as rapidly as the business will permit.

At Portland, Maine, the Foster Machine Company, with a capital of $150,000, have been organized for the purpose of manufacturing textile machinery.

The Rochester Axle Works, at Rochester, N. Y., were badly damaged by fire recently, which destroyed a quantity of new machinery just put in. The loss is in the neighborhood of $7500, and covered by insurance.

The size and capacity of the Berlin Machine Works, at Beloit, Wis., will be doubled the coming spring.

The Belt Railway Company are building a machine shop at St. Louis, Mo.

The McArthur & Gilmore Foundry Company of Cleveland, Ohio, have increased the capital stock from $10,000 to $30,000.

The Lloyd-Booth Company, proprietors of the Falcon Foundry and Machine Works, at Youngstown, Ohio, have plenty of work on hand and prospects for the future are very bright. At present they have under construction a 22-inch sheet mill for the Reeves Iron Company of Canal Dover, Ohio; a 22-inch cold-rolled sheet mill for the New Philadelphia Iron and Steel Company of New Philadelphia, Ohio; an 18-inch muck mill and two shears for the Goshen Rolling Mill Company of Goshen, Rockbridge County, Va., and expect to add to this contract a 10-inch muck mill and squeezer, and for the Oliver Iron and Steel Company of Pittsburgh they are building a large punch. This firm have also received inquiries relating to some steel machinery of special design from the iron and steel department of the Colorado Coal and Iron Company of Pueblo, Col. They expect to secure the order for this machinery within the next few weeks.

The size and capacity of the American Steel Barge Company's plant, at Superior, Wis., will probably be doubled during the coming year. The docks will be extended, the machine shop enlarged, and additional equipment put in. These improvements will necessitate an outlay of about $300,000, and are expected to increase the shipbuilding facilities from 20 to 40 boats annually.

The shops of the Union Pacific Railroad Company at Denver, Col., have so far advanced that the machinery is being set in place.

The Warwick Company have been organized at Augusta, Ga., to establish brass and iron foundries, machine shops, &c., on a large scale.

The mill property of E. Shelton, at West Stafford, Conn., has been sold to the C. W. Wainwright Company of New York, who intend to enlarge the mill and erect a brass foundry.

The sheriff has closed the machinery works of Wadworth, Seesley & Co., at Findlay, Ohio, on an execution amounting to $10,000. Slow collections are said to have caused the trouble, and it is quite likely that arrangements will be made whereby the firm can resume.

The Reeves Pulley Company, Columbus, Ind., referring to their wood split pulleys, write that with the week ending January 24 they have shipped carload lots to the following cities, Pittsburgh, Detroit and Boston, and cite this as an evidence of the popularity of their pulley.

The new establishment of the John R. Morris Foundry Company, at the southwest corner of Court and Harriet streets, Cincinnati, has been opened. It is the outgrowth of the Eagle Iron Foundry and Machine Works, established by Miles Greenwood in 1832, and located for many years at Canal and Jackson streets, and to which John R. Morris succeeded in 1866. There are associated with Mr. Morris in the business, which will employ about 200 persons, S. L. Miner, treasurer; George M. Morris, secretary; Joseph G. Neihaus, W. H. Edwards and two other directors.

The Totten & Hogg Iron and Steel Foundry Company of Pittsburgh are furnishing, besides other equipment, for the Westerman Natural Gas and Iron Company, at Marion, Ind., a large double lever plate shear. The same concern are also turning out a number of steel castings for drawbridge construction at Memphis, Tenn., and other Southern points.

The Lewis Foundry and Machine Company of Pittsburgh have under construction a 150-ton Tallman wire-rod mill for the United States Wire Nail Works at Jackson, Ohio. The same firm have just shipped a 50-ton squeezer and a large shear to the Roanoke Iron Company, at Roanoke, Va.

The entire force in the machine-tool works of Bement, Miles & Co., Philadelphia, numbering 1000 men, quit last week when the firm announced the discontinuance of their system of paying an extra allowance for overtime. After one day's deliberation the men decided to return, upon the assurance that they would not be required to work at night.

Enderline & Baronia, whose iron foundry and machine shops at Aberdeen, Miss., were recently destroyed by fire, are preparing to rebuild.

A bill has been introduced in the North Carolina Legislature incorporating the S. W. Skinner Company, at Wilmington, N. C., to operate shipyard and machine shops. The maximum capital stock of the company will be $200,000.

The Berryville Land and Improvement Company of Berryville, Va., have recently terminated negotiations for the establishment of a boiler plant. This will be a branch of the Warfield Mfg. Company, at Baltimore, Md., and will also manufacture engines of all kinds and other machinery. Work on the plant is to be begun at once and is to be completed by May.

The new foundry and machine shop at Attala, Ala., was completed last week and will go into immediate operation.

The Warwick Machine Company have been incorporated at Augusta, Ga., by F. W. Warwick, Zachariah Daniels, George W. Perkins, Adam Benson and others. The purposes of the company are the establishment of an iron and brass foundry and machine works, manufacturing iron and brass castings, building and repairing machinery, including engine boilers, &c. The maximum capital stock of the company will be $100,000. T. F. Warwick, who has been master mechanic of the Georgia Central Railroad machine shops for the past eight years, will be manager of the new enterprise. The Warwick Company will absorb the business now operated by George R. Lombard & Co. Work on the new plant will commence at once.

An iron foundry will be established at Milleggeville, Ga., by P. W. Pooser.

The South Baltimore Car Works, Baltimore, Md., will, it is stated, increase their capital stock from $200,000 to $300,000

Warren, Webster & Co., Philadelphia, have just started the second 1000 horse-power vacuum economizer in operation at Swift & Co.'s of Chicago. They have shipped over 5000 horse-power to Ohio recently, and have just received an order a 1700 horse-power vacuum economizer from a Chicago electric-light company, one order from England and two from Belgium.

Hardware.

Messrs. Jos. Lay & Co., Ridgeville, Ind., write that they are crowded very hard in their brush and broom departments just now, but are actively engaged in preparing additional manufacturing facilities and hope soon to be able to meet the largely increased demand.

The Menard Mfg. Company of Menard, Ill., are at present very busy in all their departments, with stocks low and a demand for all they produce with their present capacity. They are preparing to add an enameled hollow-ware department to their plant, for making kettles, enameled saucepans, lined stove reservoirs and other goods of the sort in either gray, white or colors. This last is a new feature in hollow-ware work in this section of the country, but the work will be conducted by men of experience in that line. At present they employ 180 men and turn out everything in the cast hollow-ware trade, including sugar kettles.

At a recent meeting of the Rogers Cutlery Company, Hartford, Conn., William H. Watrous, D. B. Hamilton, George W. Watrous and George R. Curtis were elected directors for the ensuing year. William H. Watrous was made president and treasurer and George W. Watrous secretary.

The National Horse Nail Company, Vergennes, Vt., have contracted for three additional horse-nail machines. Counters and furnaces for the machines are also in process of construction.

The Germ Proof Filter Company have been incorporated at Cincinnati, Ohio. The capital stock is $25,000.

E. S. & F. Bateman, proprietors of Spring Mill Agricultural Works, Grenloch, N. J., have been compelled to considerably extend their works since last year, and they advise us that the season of 1891 finds them with improved facilities in all respects, including that of shipping, at what has been known as Spring Mill, though now under the new name of Grenloch.

Application has been made for a charter for the Klein-Logan Company of Pittsburgh. The incorporators are John C. Klein, Edward P. Logan, Frederick C. Klein, William C. Klein and Conrad Rossman. The new concern will succeed the present firm of Klein, Logan & Co. of Pittsburgh, manufacturers of picks and mattocks.

J. Wiss & Son, Newark, N. J., manufacturers of shears and scissors, advise us that they continue, as heretofore, to make only first quality goods, improving them where they can be improved, and report that in consequence of this policy their output is increasing.

Tiffin Union Churn Company, Tiffin, Ohio, have just completed a large brick factory at Lafayette, Ind., having double the floor space of their present factory, in which is being placed latest improved and special machinery for their line of work. The firm name at Lafayette will be the Baldwin Wooden Ware Company. Correspondence may be addressed to Tiffin or Lafayette.

A. J. Phillips & Sons, Fenton, Mich., report that their trade is very active, and that they have sold for the coming season more than 250,000 screens and doors, which is a very

large increase over the amount of business they had placed at this time last season. They have been running their factory since last September, accumulating a very large stock, and they hope to be able to supply their patrons much more promptly than they were able to do last year.

The Chicago Hardware Mfg. Company have recently received permission to increase their capital stock from $250,000 to $300,000. The company have established a high reputation for their locks and other products, and their business is constantly growing.

The Watkins & Huston Barb Wire Company have opened a new barb-wire factory at Joliet, Ill. Mr. Watkins of this company was a pioneer in the barb-wire trade.

The Jay-Eye-See Hook and Terret Company have leased a building in Racine, Wis., where they will manufacture their own goods which have heretofore been made in other cities. The company are said to have a capital of $50,000, and their officers are as follows: D. McDonough, president and manager; W. H. Frawley, vice-president and secretary; C. R. Carpenter, treasurer, and C. I. Choop, superintendent.

Champion Blower and Forge Company of Lancaster, Pa., already find that the extension made to their works during last summer is barely sufficient to meet their increased requirements for space. The demand for their forges and drills reaches to every State in the Union. On pages 51 and 52 they make special reference to their specialties.

J. H. Sternbergh & Son, manufacturers of bolts, nuts, rivets, &c., of Reading, Pa., report that the volume of their business duriug the past year greatly exceeded any previous year in the history of their works. They have added important facilities, both in new buildings and in new and improved machinery, for promptly executing their increasing orders. They have employed during the past two years somewhat over 500 men steadily, and at their branch works in Kansas City about 125 men, manufacturing there substantially the same line of goods made at Reading. They make every variety of bolts, nuts and rivets, including the Harvey Grip Thread Track Bolt, the coiled steel track washer and other railroad fastenings, and are manufacturers on a large scale of boiler, bridge and ship rivets, having contracts now on hand for supplying some of the largest users of rivets in the war ships now under construction. In addition, they are prepared to make all sorts of forgings, plates, straps and rods for bridges and buildings and structural work. They report the outlook for the coming year as encouraging.

The Empire Wringer Company, Auburn, N. Y., advise the trade that their factory is in full operation, the usual number of workmen being employed in every department. The manufacturers are thus prepared to fill all orders for their Empire, Volunteer, Pearl and Daisy wringers promptly.

The partial destruction of the Housatonic dam by a flood on the 22d ult. having impaired their motive power, the Shelton Company, Birmingham, Conn., advise us that they are putting in steam power, which they will use until repairs to the dam have been completed. The interruption to the business of the company will thus be hardly felt by their customers.

Owing to want of room at their present location and the constantly increasing demands of their business, Hussey, Binns & Co., Pittsburgh, Pa., are removing their plant to Charleroi, on the Monongahela River division of the Pennsylvania Railroad, about 40 miles outside of Pittsburgh and on the top of the Belle Vernon natural-gas field. Here they have nearly completed three new factory buildings, comprising a rolling mill, 225 x 90 feet, where they will manufacture and roll their own crucible and bar steel; the shovel mill proper, 275 x 90 feet, and a warehouse for handles and finished goods, 200 x 80 feet. The new plant, when in full running trim, will have a capacity of from 200 to 250 dozen per day, provision being also made for additional machinery to increase this output if necessary. The company are now in the midst of moving their machinery, and expect to be in full running order prior to April 1.

Miscellaneous.

It is reported that the Metric Metal Company of Beaver Falls, Pa., have decided to remove their plant to Erie, Pa. An architect of the latter-named place has been ordered to prepare plans for buildings at once, and the removal will take place as soon as these have been finished.

An establishment for the manufacture of all kinds of agricultural implements is being erected in Red Bank, N. J. The promoter of this new enterprise is T. Edwin Griggs, who was until recently engaged in the same business at Hightstown. The factory will consist of three buildings—a machine shop, a woodworking shop and an iron foundry. The establishment will be ready for business about the middle of February.

The plant of the late E. A. C. Duplaine, at No. 240 South Jefferson street, Chicago, has been purchased and materially enlarged by F. W. Thayer & Co., who are prepared to supply any of his former grades and brands, or those of their own. The firm will manufacture car and locomotive brasses, brass castings and Babbitt metals generally. F. W. Thayer is well known to the public. He has enjoyed a practical experience of 20 years in the business, and built up a reputation for enterprise and ability. He was the founder of the Thayer Mfg. Company of Milwaukee, Wis., of which he was president.

The Secretary of State of Illinois has recently issued incorporation licences for the following new companies: Columbia Oil and Huller Company, at Chicago; capital stock, $1,000,000; to deal in cotton and cotton seed, to manufacture and refine cotton seed oil and all kinds of cotton or other seed products; incorporators, Charles L. Arnold, Charles J. Haines and Ephraim Banning. Chicago Investment and Construction Company, at Chicago; capital stock, $1,000,000; to construct railroads, warehouses, docks, rolling mills, blast furnaces and machine shops and all internal improvements; incorporators, Henry S. Waldron, George W. Lewis and Leroy Armstrong. Danville Wagon Company, at Danville; capital stock, $25,000; for the manufacture of wagons and buggies; incorporators, David R. Snyder, R. Holmes and F. Lindley. The American Pontoon Bridge Combany, at East St. Louis; capital stock, $500,000; for the construction and operation of bridges and culverts of all kinds; incorporators, M. S. Carter, A. W. Hubbard and Henry B. Davis. Chicago Consolidated Novelty Company, at Chicago; capital stock, $25,000; for the manufacture of novelties and hardware specialties; incorporators, G. W. Cole, M. J. Bartlett and W. C. Collins.

The firm of Ward & Byrne, dealers in iron, steel, hardware and leather belting, doing business at Nos. 451 and 453 Broadway and Nos. 33 and 36 Dean street, Albany, have made a general assignment to Robert G. Scherer. The payment of the individual employees and separate debts of liabilities of the co-partners is first directed by the terms of the assignment, and the surplus, if any, of their separate estates to be then turned into the co-partnership assets. The employees of the firm are ordered paid out of the assigned partnership property, after which the following liabilities are ordered paid in the following amounts, and in the order indicated: The National Exchange Bank, $2,575; Andrew A. Waters, $2000; Maurice L. Ryder, $425.36; Erastus Corning, $575; Jacob D. Van Buren, $600; E. W. Howell & Co., $143.25; Troy Steel and Iron Company, $1383.05; Dudley S. Steele of Jersey City, $1000; J. W. and Frank B. Griswold, $5182.62; Clifford D. Gregory, $160.

We have been authoritatively advised that the statement is premature that the property of the Warwick Iron Company at Pottstown, Pa., has been sold to an English syndicate. As yet the negotiations have not been consummated.

The announcement of the sale of the Crane Iron Company's property for anything like the sum named has been received with general skepticism in the Eastern iron trade, and so far as we can learn has not been carried through.

On Tuesday, the 3d inst. a charter was granted to the Adams Iron Company of Pittsburgh, with a capital stock of $200,000. The directors are George D. Blair of Huntingdon County, Pa.; Thomas S. Blair, Jr., and F. Protzman, Sr., both of Pittsburgh. This company propose to manufacture crucible-steel stock by the Adams direct process, controlled by the Steel and Iron Improvement Company of Pittsburgh. Their plant will probably be located at Glenwood, near Pittsburgh.

The Hecla Iron Works, in Brooklyn, were wholly destroyed by fire early yesterday morning, and the loss is roughly estimated at from $200,000 to $300,000. Explosions in the casting rooms caused the destruction of factories adjacent.

It is reported upon good authority that Pephro D. Pike of Boston; F. J. Cushing, Lynn, Mass., and John Maxwell, Boston, Mass., have purchased the Pell City Land Company's entire property at Pell City, Ala. They are credited with the plan of starting manufacturing enterprises in addition to the pipe and steam-fitting establishment now being built there by P. D. Pike.

The Lone Star Cotton Picking Machine Company, 150 La Salle street, Chicago, have made arrangements to build a plant at Waco, Texas, for the manufacture of the machines, and are now in the market for a considerable quantity of machinery. It has taken five years of constant experimenting to perfect the company's device for picking cotton; but it has only been within a recent period that they were able to claim confidently that they had overcome all difficlties. Their latest machine has been tested by two months of constant work in cotton fields, and a pamphlet just issued by the company contains numerous testimonials of its efficiency from Southern planters who witnessed its operations. The importance of the field to be filled by this machine is seen from an estimate made by experienced judges that it costs $100,000,000 to pick by hand the cotton crop of the South. The company claim that 90 per cent. of this outlay can be saved by the use of their machine. Their intention is to manufacture machines for rent to planters or cotton-picking companies.

The centennial of the birth of Peter Cooper will be celebrated on February 12 under the auspices of the Cooper Union Alumni Association. A public meeting will be held in the large hall of Cooper Union on the evening of that day, when Abram S. Hewitt will preside. The oration will be delivereti by Seth Low, president of Columbia College.

Hull, Wyman & Cairns of Pineville, Ky., have published reports by A. R. Crandall of the Kentucky Geological Survey and G. D. Fitshugh, consulting engineer of the Louisville and Nashville Railroad, on a tract of 25,000 acres of coal lands on Log Mountain, Bell County, Ky.

The new celluloid company, at Newark, N. J., which includes all but one of the manufacturing interests in celluloid and kindred material, represents a capital of $8,000,000, which, previous to the amalgamation, was controlled by half a dozen companies. The combined net earnings of all these companies last year are said to have been near $600,000. The new company's officers and factory officials are as follows: President, M. C. Lefferts; vice-president, John A. Barton; secretary, J. M. Cook; treasurer, F. R. Lefferts; consulting expert, John W. Hyatt; manager of novelty department, W. S. Silcox; manager of collar and cuff novelty department, C. L. Balch; manager of manufacturing department, John H. Stevens; selling, W. C. Smith; chemist, F. W. Vanderpool; factory superintendent, W. H. Wood.

A 10-inch iron-wound gun is now being made at the Watervliet Arsenal, Troy, N. Y.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., February 3, 1891.

Commencing the second month of the year, there is nothing specially encouraging to say in regard to the Iron trade, except that Pig Iron seems to have about touched its lowest point. This is due more to decreased production than to increased consumption, so that while Pig appears to be steadying, finished Iron is less favorably situated, and is weak and irregular. It is extremely difficult to say how soon there may be a turn for the better, but the general condition of business is by no means as unsatisfactory as might be inferred from the appearance of the Iron trade. Nearly all the large manufacturing concerns are still running full time, and as yet see no indications of any change of a less favorable character. Such concerns as the Baldwin Locomotive Works, Wm. Sellers & Co., Southwark Foundry and Machine Company, Bement, Miles & Co.; Gordon, Strobel, & Laureau; Geo. V. Cresson, and others of that class, firms that are employing all the way from 400 to 4500 men each, are full of work, and from present appearances are likely to continue so indefinitely. Shipbuilding is a little dull, apart from Government work, and the same may be said of bridge and car building, although in the two last mentioned there is business in prospect which may impart great activity to those interests before long. In point of fact, the general outlook is considered quite up to the average, with a very fair chance of developments which may result in an unusually large amount of business as the season advances. The great trouble is in the vast increase of productive capacity, which is now, as it usually is, very much in excess of consumptive requirements. The result is the sharpest kind of competition, and a range of prices that leaves little or nothing to the manufacturer. But, in the hope of something better turning up in the near future, there is a disposition to get what business they can sooner than close up furnaces or mills and see their trade pass into other hands.

Pig Iron.—The market is certainly no worse than it was a week ago, and many well-informed people consider there is an improvement. As regards the demand, this is probably true, while prices if not better, are at least steady to firm. A great deal of business has been entered, and many of the leading furnaces are so well sold up that, so far as they are concerned, there is no necessity for shading prices. There are others, however, that are carrying a large amount of Iron, but they have held it all the way through at comparatively high figures, and intimate that they have no intention of changing their position now. There is still another class, who have had irregular Irons, and irregular prices, and these too appear to have determined to make a stand, so that while prices may not improve to any extent, there is still less chance of any opposite movement. The question naturally arises, what is the price of Iron? This is in a measure answered by quotations at the close of this paragraph, the difference in price being in quantity, quality, terms of payment, time and point of delivery, &c. Ordinarily $14.50, delivered, is a firm quotation for good Mill Irons, although some makers refuse to consider anything at less than $15 @ $15.50. On the other hand $14.50 has been shaded for large lots of strictly good neutral all ore Iron, so that from $14.25 to $15.50 covers both extremes of the market. Foundry Irons show a similarly wide range, say $16.75 @ $18, delivered, for good to choice No. 1. The general outlook for the immediate future appears to be somewhat encouraging. A continued good demand for the next couple of weeks would do a great deal to lift things out of the rut into which they have fallen, and there is some hope that this will be the case. A good deal depends on advices from other markets, as the trade here is in a condition to give prompt response to a better feeling at other competitive points. The following quotations for lots delivered in consumer's yards are fairly representative of to-day's market, viz:

Ohio Softeners, No. 1x	$19.00	@	$19.50
Ohio Softeners, No. 2x	18.00	@	18.50
Standard Penna, No. 1x	17.50	@	18.00
Standard Penna, No. 2x	16.50	@	17.00
Medium Penna, No. 1x	17.00	@	17.50
Medium Penna, No. 2x	16.00	@	16.25
Virginia, No. 1x	16.75	@	17.50
Virginia, No. 2x	15.50	@	16.00
Standard Neutral All-Ore Forge	14.50	@	15.00
Ordinary Forge Cinder mixed	13.50	@	14.00
Charcoal Car-Wheel Iron	22.00	@	26.00

Coke.—The market is a trifle more active on Connellsville, in anticipation of some difficulty with labor in that region. Prices for that Coke are from $1.85 to $1.90, and for outside Coke $1.75 @ $1.80.

Steel Slabs and Billets.—There is very little business to report in this vicinity, but there are a good many inquiries, and it is said that a large business could be done at about $27.75, at sellers' mills nearby. Quotations from other points are equivalent to about $28.50 @ $28.75, delivered; but buyers and sellers do not appear to agree on prices, so that there is absolutely nothing to report, except bids and offers, say buyers at $28, delivered, and sellers at $28.50 @ $29.

Steel Rails.—Business is on an extremely limited scale at present, although it is said that inquiries are on the market for several quite large lots. Manufacturers quote $30 at their mills, and are not likely to make concessions, although buyers of large lots make strenuous objections to that figure. Orders will have to be given out soon, however, and there is no reason to think that business will be done at less than the price named. The Pennsylvania Railway order for 60,000 tons is expected to be closed this week, price said to be $30 at mills.

Muck Bars.—No business to report of any consequence. Buyers offer $26.50, delivered, for 1000-ton lots, while sellers show a good deal of firmness at $27.25. It is thought that the strike at some of the mills in the neighborhood will have a tendency to stiffen prices, although it is stated that a sale of 1000 tons was made this P.M. at $26.50, delivered.

Bar Iron.—Market very quiet. Some mills refuse to accept any businesss at less than 1.85¢ @ 1.90¢, while others appear to be glad to secure offers of 1.75¢ @ 1.80¢. There is undoubtedly a great scarcity of work at many of the mills, and until they can get something ahead prices are likely to remain as they are to-day—weak and unsettled. There is some talk of orders for cars coming on the market, but there is nothing likely to have much influence on prices for the present. Quotations are as already stated, weak and irregular, depending in some measure on the amount of work on hand, or in prospect.

Skelp Iron.—Market very weak. The falling off in the demand for Pipe for natural gas purposes is beginning to be felt quite seriously, and for the present there is nothing to indicate much improvement in the near future. Prices are, therefore, very weak, with sales as low as 1.75¢, delivered, for Grooved, and 1.85¢ @ 1.90¢ for Sheared.

Plates.—There is a somewhat improved demand for Plates, but prices are still irregular and unsettled. There is nothing very heavy on the market at present, the demand being of a miscellaneous character, and pretty well divided among consumers of all classes. Something has been done in Ship Plates for the Lake districts, the Lukens Iron and Steel Company of Coatesville having received quite a large order from that source, as well as several important orders for Boiler Plates, &c. The Catasauqua Mills have also taken one or two good orders for Bridge Plates, so that, on the whole, things are looking a shade brighter. Prices remain as last quoted—say, for lots delivered in consumers' yards, about as follows:

	Iron.	Steel.
Ship Plates	2.00 @ 2.10¢	2.10 @ 2.20¢
Tank	2.00 @ 2.10¢	2.10 @ 2.20¢
Bridge Plate	2.05 @ 2.15¢	2.15 @ 2.25¢
Shell	2.30 @ 2.40¢	2.40 @ 2.50¢
Flange	3.10 @ 3.20¢	2.60 @ 2.70¢
Fire-Box	3.75¢	3.75 @ 4.25¢

Structural Material.—The demand is not specially important at present, although specifications on old contracts appear to keep the mills fairly employed. New work comes in moderately, and in a small way, but manufacturers expect plenty of business later on. Prices are irregular, but for deliveries in consumers' yards are usually quoted about as follows: Angles, 2.05¢ @ 2.15¢; Sheared Plates, 2.10¢ @ 2.20¢, and from 10¢ to 20¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—Considering the general surroundings, business in this department is quite as good as could be expected. Prices are somewhat irregular, and at moderate concessions a great deal of business might be had, but best makes are still held at about the following prices:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.15¢ @ 3.25¢
Best Refined, Nos. 25 to 26	3.30¢ @ 3.40¢
Best Refined, No. 27	3.50¢ @ .....
Best Refined, No. 28	3.60¢ @ 3.70¢

Common, ¼¢ less than the above.

Best Soft Steel, Nos. 14 to 20	3¼¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24	3½¢ @ 3⅝¢
Best Soft Steel, Nos. 25 to 26	3¾¢ @ 3⅞¢
Best Soft Steel, Nos. 27 to 28	@ 4⅛¢

Best Bloom Sheets, 1-10¢ extra over the above prices.

Best Bloom, Galvanized, discount	@ 65 %
Common, discount	@ 67½ %

Old Rails.—Nominal at from $23 to $24, according to quantity and point of delivery, but there is so little doing in them that it is difficult to give exact quotations.

Wrought-Iron Pipe.—The demand is somewhat irregular, small sizes being comparatively active, while the larger sizes are dull and neglected. This is due in a measure to the falling off in the demand for natural gas Pipe, which at this time a year ago was in urgent request. Prices are feverish and unsettled, and unless there is some improvement in the demand will probably be lower, although the manufacturers have determined to maintain quoted rates until the extent of the spring demand becomes more fully developed. For the present, therefore, discounts remain as last quoted, viz.:

Butt-Welded Black	47½ %
Butt-Welded Galvanized	40 %
Lap-Welded Black	60 %
Lap-Welded Galvanized	47½ %
Boiler Tubes	50 %

Scrap Iron.—Owing to larger supplies, prices are somewhat lower, although there is a fair demand, with sales at about the following prices: No. 1 Railroad Scrap, $22 @ $23.50, Philadelphia, or for deliveries at mills in the interior, $22 @ $23, according to distance and quality; $15 @ $16 for No. 2 Light; $15 @ $16 for best Machinery Scrap; $14 @ $14.50 for ordinary; $15 @ $16 for Wrought Turn-

ings; $10.50 @ $11 for Cast Borings, and nominally $24 @ $26 for Old Fish Plates and $17 @ $18 for Old Car Wheels.

Wm. R. Cason, for ten years confidential assistant of his uncle, the late Charles W. Matthews, and J. M. Mays, for many years with the late firm of Seyfert, McManus & Co., have formed a partnership under the style of Wm. R. Cason & Co., to continue the Iron brokerage business, and have located in the former office of the Merion Iron Company, 209 Walnut place, corner Willings alley.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., St. Louis, February 2, 1891.

Pig Iron.—The present condition of the market is to a certain extent difficult to explain. The demand is only fair, and prices are droopy and inclined to weakness. Consumers are imbued with the idea that prices are yet too high for them to profitably enter the market as buyers, and are holding off, looking for a lower range of values. This opinion is catered to by furnacemen, inasmuch as, when a prospective buyer is scented, he is not allowed to rest until his order is secured, and to accomplish this purpose prices are sometimes shaded quite severely. A large number of inquiries have been received during the week under review, but orders have not been forthcoming, either because prices were not low enough, or else the inquiries were sent forth merely as a means of testing the market. There is something of a scarcity of No. 1 Foundry and No. 2 Soft, and furnaces refuse to shade prices for these grades. Taking the general situation into consideration it is difficult to see anything to encourage an early return to higher prices, and it looks as though consumers will be able to supply their wants for the next few months at figures that will be advantageous to them, but will hardly net the furnace any great profit. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$15.50 @ $15.75
Southern Coke, No. 2 Foundry,	14.50 @ 15.00
Southern Coke, No. 3 Foundry,	14.00 @ 14.50
Gray Forge	13.50 @ 14.00
Southern Charcoal, No. 1 Foundry	17.00 @ 17.50
Southern Charcoal, No. 2 Foundry	16.50 @ 17.00
Missouri Charcoal, No. 1 Foundry	15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry	14.75 @ 15.25
Ohio Softeners	17.75 @ 19.25

Bar Iron.—Some slight improvemen is noticeable in this department since our last report. Prices have stiffened up somewhat and the demand has increased considerably. There are, however, a few mills who appear anxious to fill their order books for some months ahead, and to do this are shading prices. As a rule, however, mills are inclined to adhere to about the following prices: Lots from mill 1.70¢ @ 1.75¢. Small lots from store 1.85¢ @ 1.90¢.

Barb Wire.—The improved condition both in demand and price, which has been a feature of this department for the past three weeks, continues. Mills are kept busily employed, and prices as quoted below are firmly adhered to. The outlook for a large spring trade is considered particularly encouraging, and mills are working up large stocks, so as to be in a position to meet the demand, which promises to be unusually heavy. We quote as follows: Lots of Painted from mill command 2.80¢; Galvanized, 60¢ additional. Carload lots 5¢ ℔ cwt. less than above prices.

Cleveland.

CLEVELAND, February 2, 1891.

Iron Ore.—The engagement of a vessel to carry Ore from Escanaba to Tonawanda is not disputed in Iron circles, although no one seriously believes that the price agreed upon was $1.10 ℔ ton. Instead it is very vigorously maintained that the rate is below $1—probably 90¢. Nothing further seems to have been done in the way of engaging lake carriers for the coming season, although the Ore men assert that the minimum transportation charges paid in 1890 are likely to be the maximum rates for the coming season. Only 12,000 tons have gone forward to the furnaces during the past week, an almost imperceptible part of the great mountain of Ore on the local docks. The Baackes Wire Nail Company announce that it is their intention eventually to manufacture Steel Wire Nails direct from the Ore, and buildings for that purpose are now being added to that company's extensive plant here. The company will also manufacture Steel, having recently found it necessary to go into an outside market for 8000 tons of this material.

Pig Iron.—A sale of Bessemer at $15.50, cash, at the furnace is announced in one quarter, while in another it is said that additional inquiries for Strong Foundry and Ohio Silveries have been made. It is true, however, that the general condition of the market is one of waiting. Prices seem fairly firm at the present low quotations, and there is certainly more activity than before the shut down. Consumption of Pig Iron is reported heavy, a fact that encourages the furnacemen in their belief that no mistake is being made in awaiting developments. The position of the buyers, however, seems less tenable, as there is scarcely a possibility of prices going lower.

Old Rails.—The market is quiet with about $25 the asking price for Old Americans. Old Wheels are worth about $17.

Scrap.—There is a fair demand with No. 1 Railroad Wrought still quoted at $20; Cast Scrap $13 @ $13.50, gross, and Wrought Turnings $12 @ $12.50.

Manufactured Iron.—Many inquiries are reported, although prices are somewhat easy. Common Bar at $1.70¢ @ 1.75¢, is selling quite freely.

The Babcock & Wilcox Company of New York, manufacturers of water tube boilers, have opened an office at 412 Perry-Payne building this city. Mr. George A. Humphreys will be placed in charge.

The Cleveland Ship Building Company have received an order for two boilers 11 feet in diameter, 10 feet 6 inches long, for the ocean steamship Kinau, now being remodeled at Honolulu.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, February 4, 1891.

Except in Pig Iron, the business of the past week has been of fair volume, and in some cases there has been an approach to activity. The condition of trade is such that if the railroads were to buy as they usually do at this time of the year there would be a decided stiffening in prices. General business is in excellent shape, but railroad business lags far behind. The worst of it is that railroad men are making very gloomy predictions regarding their trade, some of them fixing nine months as the period which must be passed before an improvement can be expected. This is perhaps an extreme view, but there is no question that for some months to come the railroads of the Northwest will purchase material very sparingly, and that the effect of their enforced economy will be felt by the manufacturers of Iron and Steel.

Pig Iron.—All agents and dealers report a quiet market. Large buyers seem to be well stocked for the present, and those whose requirements are not pressing are evidently waiting to see whether sellers are in earnest in asking higher prices. Neither Northern nor Southern furnace companies will now sell at the rates current last week. The advance applies to Coke Iron alone. In view of the rapid restriction of production, and the evident drop in prices below cost, the advance has been compelled by the force of circumstances. Some makers think that the lowest prices of the year were seen last month, and that the transactions made then will not be duplicated in this market during the present depression. The future will have to determine whether this view of the situation is correct or not. Lake Superior Charcoal is by no means in the some shape. Prices are weaker, if anything, and the best advice that can be offered to manufacturers is to blow out their furnaces and stop further accumulations of Iron, which can only depress prices still more. Southern Mottled is very scarce. We quote:

Lake Superior Charcoal	$18.00 @ $18.50
Local Coke Foundry, No. 1	15.50 @ .....
Local Coke Foundry, No. 2	15.00 @ .....
Local Coke Foundry, No. 3	14.50 @ .....
Local Scotch	16.00 @ .....
American Scotch	18.00 @ 18.50
Southern Coke, No. 1	16.00 @ 16.50
Southern Coke, No. 2	15.50 @ 16.50
Southern Coke, No. 3	14.50 @ 15.00
Southern, No. 1, Soft	15.50 @ 16.00
Southern, No. 2, Soft	14.50 @ 15.00
Southern Gray Forge	14.25 @ 14.50
Southern Mottled	14.00 @ 14.25
Tennessee Charcoal, No 1	18.50 @ .....
Alabama Car Wheel	22.50 @ 23.50
Coke Bessemer	17.00 @ .....
Hocking Valley, No. 1	17.50 @ .....

Bar Iron.—A better inquiry is reported, but many mills are hungry for orders, and prices are not improving. Contracts for 1000 cars have been placed here and at Detroit, but business in this line is of very small proportions as compared with what it should be. The bulk of mill business at present comes from the jobbers, with a few orders straggling in from wagon makers. Mill orders are quoted by local makers at 1.70¢ @ 1.75¢, Chicago, half extras, and by Valley makers at 1.60¢, mill, but reports of cutting are very common, and on orders at all desirable these rates can be shaded.

Structural Iron.—The Architectural Iron works report a great deal of business in sight, both here and at other points in the Southwest, and are looking forward to a very active season in the building line. Mill lots of Steel Angles are now selling at 2.25¢ @ 2.35¢, and Steel Tees at 2.70¢ @ 2.85¢, Chicago. Iron Angles and Tees are somewhat cheaper, but not in as great demand. In Beams and Channels a fair trade is being done in small lots, but large orders are rare. They are unchanged at 3.20¢ from mill.

Plates.—Business for the past week has been confined to small lots, but trade has been increasing latterly with that class of consumers. Considerably more activity is expected within the next two weeks, as a result of inquiries now coming forward. While mill prices are low, there has been no change in store prices, owing to the excellent local demand. Nos. 10 to 14 Iron Sheets, 2.75¢ @ 2.80¢; Steel Sheets, 3¼¢ @ 3¼¢; Tank Iron, 2.60¢ @ 2.70¢; Tank Steel, 2.80¢ @ 2.90¢; Shell Iron or Steel, 3.25¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.25¢ @ 5.5¢; Boiler Rivets, 4¢ @ 4.25¢; Boiler Tubes, 45 % off for 1¼ inch or less; 50 % off for 2 to 4 inch.

Sheets.—In the face of a light business some manufacturers of Sheets are advancing prices, and now ask 2.90¢ at mill for 27 Common. Others, however, quote 2.80¢ @ 2.85¢, as before. A few large dealers are in the market to place orders for May to July delivery, but makers are not yet inclined to take such business at present prices. Galvanized Iron is in still better demand than last week, but prices have not improved, small lots of Juniata still selling at 65 % off.

Merchant Steel.—Spring and Machinery Steel have been taken in very fair quantities by consumers since our last report, and prices were not forced to the limit then named, but the market is irregular, quotations varying according to the necessities of the various mills. Tool Steel is selling in considerable quantities at 6.75¢. Usual quotations are 2.40¢ @ 2.50¢ for Tire Steel, 2.40¢ @ 2.75¢ for Open Hearth Machinery, 2.50¢ @ 3¢ for Open-Hearth Spring, 2.20¢ @ 2.30¢ for Bessemer Machinery and 2.50¢ @ 2.75¢ for Toe Calk. January business of the Chicago Steel houses was considerably in excess of January last year.

Track Supplies.—Inquiries for Steel Rails continue to improve, and some good orders have been taken recently by the local mills. Prices have enhanced, and quotations now range from $31 to $32. For carload orders $32.50 has been paid. Orders for Fastenings are light. Steel Splice Bars are quoted at 1.85¢ @ 1.95¢; Iron Splice Bars 1.95¢; Spikes $2.15 in a small way down to $2 from mill; Track Bolts with Hexagon Nuts 3¢ for small lots, down to 2.80¢ from mill.

Old Rails and Wheels.—Old Iron Rails seem to be firmer, and quotations now range from $22.75 to $23, Chicago. It is understood that dealers have been quietly picking up all offerings on their own account for some time. Purchasing agents are chary about closing for Rails at present prices to be delivered in the future as they are taken up. A scarcity is plainly perceptible, and while it may be only temporary, it may, on the other hand, become yet more pronounced. Old Steel Rails are quiet at $14 @ $18.50, according to length. Old Car Wheels are rather quiet, although some dealers report having had a fair trade. Carload lots sell at $18, but 100-ton lots and over are quoted at $17.25 @ $17.50.

Scrap.—Forge is in fair demand. Mill Scrap is lower. Steel is at length in some slight request. Matters are a little brighter for dealers, but occasionally one is forced to realize, and sales are then made which seem quite low. Dealers' quotations are as follows ℔ ton of 2000 lb.: No. 1 Railroad, $19.50; No. 1 Forge, $18 50; No. 1 Mill, $13.50; Fish Plates, $22; Axles, $25; Pipes and Flues, $13; Horseshoes, $17.50; Cast Borings, $8; Wrought Turnings, $11.50; Axle Turnings, $13; Machinery Cast, $12; Stove Plates, $9; Mixed Steel, $11.50; Coil Steel, $15; Leaf Steel, $16, and Tires, $18.

Metals.—The situation is unchanged from last week, except that Copper is in better demand and that Spelter has declined to 4.80¢, with but light sales, and Desilverized Lead is freely offered at 4.15¢.

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., writing under date February 2, say: While the natural result of such a large number of idle furnaces in the Mahoning and Shenango valleys, and also in the South, would be to stiffen prices, even if an actual advance did not take place, yet prices remain weak, and in some cases even lower than at any time for months. Consumption in most lines is quite heavy, but when a buyer makes inquiry he is offered in almost any quantity and delivery he asks at figures below those at which he has been able to purchase previously. Some furnacemen refuse to contract for more than 60 to 90 days, but others seem anxious to accept present prices for six months, and a few will even make deliveries for the balance of the year. Unless the production for February is considerably less than the consumption, it will be difficult to induce buyers to anticipate their wants. The demand for Lake Superior Charcoal is about the same as usual for this season of the year, and any small cut in present quotations would not be likely to increase the volume of trade to any great extent, as the larger buyers place their contracts during the summer months for their needs until the following May or June. With a quiet market and prices unchanged, we quote as follows:

Lake Superior Charcoal, all numbers	$19.00 @ $19.50
Lake Superior Coke, Bessemer	18.00 @ 18.50
Katahdin (Maine Charcoal)	23.00 @ 24.00
Lake Superior Coke Foundry, all ore	18.00 @ 18.50
Ohio Blackband (40 per cent.)	18.00 @ 18.50
Southern No. 1	15.75 @ 16.25
Southern Gray Forge	14.00 @ 14.50
Jackson County (Ohio) Silvery,	18.25 @ 18.75
Connellsville Coke	4.65

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, February 3, 1891.

Pig Iron.—There has been an increased volume of business during the past week, but at still lower prices. Consumers are not now afraid to buy, and some of them have anticipated future wants. One firm reports having contracted for enough to meet their requirements for several months to come. Heretofore consumers expected every time they bought to do so at a lower price, and this accounts for the very limited volume of business for several months past. Now, however, that prices are down below cost of production, with production still being reduced by additional furnaces going out, it is not strange that consumers are disposed to buy more freely. There is but comparatively little Iron being offered here from the Shenango or Mahoning valleys, as furnacemen out there say they are able to do better at home than in this market; some of the furnacemen whose furnaces are out and who have considerable Iron piled up are holding for a better market, they want from $1 to $1.50 per ton more than present prices, and being in condition to do so, purpose to hold until their expectations are realized. We now quote prices as follows:

Neutral Gray Forge	$13.75 @	$14.00,	cash.
All-Ore Mill	14.50 @	14.75,	"
White and Mottled	13.00 @	13.50,	"
No. 1 Foundry	15.75 @	16.00,	"
No. 2 Foundry	15.00 @	15.25,	"
No. 3 Foundry	14.50 @	14.75,	"
No. 1 Charcoal Foundry	23.50 @	24.00,	"
No. 2 Charcoal Foundry	21.50 @	22.00,	"
Cold Blast Charcoal	26.00 @	28.00	"
Bessemer Iron	15.50 @	15.75,	"

Included in the sales reported was a lot of 3000 tons Bessemer Iron, sold by one city furnace to another at $15.50, spot cash. The furnace buying had contracts, and, with apprehensions of a Coke strike, thought it better to cover than take the chances. Several thousand tons of Forge Iron have been sold by city furnaces during the past week, and nearly all at $14, cash, which may now be regarded as the ruling price. The Valley furnacemen are still clamorous for cheaper Coke and freight rates. Coke was reduced some weeks ago, but the reduction was not satisfactory.

Muck Bar.—There is not much doing and the market is weak, in sympathy with Pig Iron. May be quoted at $27.50 @ $28, cash, as to quality and delivery. Some special lots, both as to size and quality, are bringing 50¢ @ $1 ℔ ton more. A lot of 200 tons of the latter was reported at $29. But ordinary Muck may be quoted at $27.50, at which there was a sale reported of 1000 tons.

Manganese.—There has been but little business reported the past week; 80 % domestic quoted at $64 @ $65 per ton in small lots. Foreign 80 % cannot be laid here from the seaboard much if any below prices quoted.

Manufactured Iron.—There is considerable inquiry and a fair business, but prices are weak in sympathy with Pig Iron, and it is probable that a good many largle buyers are holding back, so as to be in position to take advantage of the situation if prices should go still lower. For first quality Iron Bars may be quoted at 1.75¢ @ 1.80¢; Plates and Tank Iron 2.10¢ @ 2.15¢; No. 24 Sheet, 2.75¢ @ 2.80¢; Grooved Skelp, 1.75¢ @ 1.80¢; Sheared Skelp, 2¢ @ 2.05¢—all 60 days, 2 % off for cash.

Nails.—The Cut Nail trade continues in an unsatisfactory condition so far as manufacturers are concerned, and there does not appear to be much prospect of any immediate improvement. So far as the volume of business is concerned there is not much cause of complaint, but there is no margin for profit at current prices, which it is claimed do not cover actual cost of production. We continue to quote at $1.55 @ $1.60 rates, 60 days, 2 % off for cash, for large blocks, and $1.65 to $1.70 for car lots, and upward. Wire Nails continue firm, with an increasing inquiry, and prices have further advanced; we now quote at $2.10 @ $2.15 for large lots, f.o.b. at factory. There has been an advance of 10¢ ℔ keg within the past couple of weeks.

Wrought-Iron Pipe.—There is a very fair business, which will probably be increased before long, as we understood that the Standard Oil Company are on the market for some large lots of Pipe. Prices remain unchanged. Discounts on Black Butt, 27½ %; on Galvanized do., 40 %; on Black Lap, 60 %; on Galvanized do., 47½ %.; Boiler Tubes, 1¾ inches and smaller, 45 %; 2 inches and larger, 50 %; Casing, all sizes, 50 %.

Barb Wire.—While business is reported a little slow, large shipments are being made by manufacturers, but it is probable that many of these shipments are being placed on former contracts. Prices unchanged. Painted, $2.60 @ 2.75; Galvanized do., $3.10 @ $3.25.

Old Rails.—There has been an increased business during the past week, sales of some 2000 tons of Old Iron Rails having been reported at $24.50, delivered at Youngstown, Ohio; we are also advised of an offer to buy 2000 tons for February, March and April at $25.50 having been declined. Old Steel Rails are also in demand, with sales of short and mixed pieces reported at $16 @ $17.

Wire Rods.—There is still considerable inquiry, with but few of the mills in position to sell either for immediate or near-by delivery. The Braddock Rod Mill, owing to labor troubles, has been standing idle for some time past. We now quote at $38.50 @ $39.50, on cars at mill, an advance of $3 to $3.50 ℔ ton, as compared with the lowest point.

Structural Iron.—Not much new business being placed, but considerable inquiry, which, it is hoped, will lead to increased business. No change in prices. Beams and Channels, 3.10¢; Angles, 2.15¢ @ 2.25¢; Steel Bridge Plates, 2.40¢ @ 2.45¢.

Billets and Slabs.—Manufacturers continue to quote at $26 @ $25.50, although rumors obtain of sales having been made as low as $25.75. As intimated

in our report a few weeks ago, it is believed that an effort is being made to bear this market, and that sales are being reported that were not made to accomplish the object in question. Manufacturers here are pretty well sold up and do not have to cut prices in order to get business. Nail Slabs about the same in price as Billets.

Steel Plates.—There is nothing new to record; business fair, prices unchanged. Fire Box, 4.25¢ @ 4.50¢; Flange, 2.80¢ @ 2.90¢; Shell, 2.60¢ @ 2.70¢; Tank, 2.25 ¢@ 2.35¢.

Steel Rails.—There have been no sales reported here of late, and business, as elsewhere, is dull. However, there will, no doubt, be an increased demand as the season becomes more advanced. The Edgar Thomson mill will shut down on February 14 to make improvements and repairs.

Merchant Steel.—Business is still reported light, while prices remain unchanged.

Railway-Track Supplies. — Business continues light, but it is hoped will improve soon. Prices remain unchanged. Spikes, either Iron or Steel, 2.10¢, 30 days, f.o.b. at makers' works; Iron Splice Bars, 1.90¢ @ 2¢; Steel Splice Bars, 2¢ @ 2.10¢; Track Bolts, 2.80¢ with Square and 2.90¢ with Hexagon Nuts.

Old Material.—There appears to be an increasing inquiry for No. 1 Railroad Wrought Scrap, which is quoted at $20, net ton; Old Iron Axles, $27.50 @ $28 ; Cast Scrap, $14.50, gross; Old Car Wheels, $17; Steel Rail and Bloom Ends at $17 @ $17.50.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, February 4, 1891.

The past week has been fertile in inquiries for Iron in both large and small amounts. These have opened the way to several transactions of magnitude and a number of small sales have followed. But while the volume of business has increased, prices have not advanced. The improvement in tone noted some few weeks ago has borne some fruit, in that sellers are demanding full market rates, and there is less disposition among holders to grant special rates. Contracts involving considerable Iron, however, have not been wanting in which furnaces have seen fit to grant concessions. Pipe companies in the North have been the largest purchasers recently, mainly of Gray Forge and No. 3 Foundry, but other concerns in Indiana have also been in the market for considerable amounts. In one or two instances local agents of large companies have invaded the Chicago territory and made liceral sales at fair prices because other large stacks were practically out of the market in the grades desired by consumers. Mottled Iron continues scarce and wanted, and remains relatively higher than Gray Forge. The large increase in stocks of Coke Iron during December will doubtless be followed by a reduction during January, as the report now looked for will probably show; but the consumption during January was reduced as well as the production, and this fact will tend to show less improvement than has been anticipated. Among the larger sales reported during the week are 5000 tons Southern No. 2 Soft, on a basis $10.50 cash, Birmingham; 3000 tons No. 3 Foundry and Gray Forge, on basis $9.50 and $10, cash, respectively; 3000 tons same grades, within fraction of same basis, and 1500 tons Gray Forge and Moottled Iron, on basis of quotations. The prices current for cash are approximately as follows, f.o.b. Cincinnati:

Foundry.	
Southern Coke, No. 1	$14.25 @ $14.50
Southern Coke, No. 2	13.75 @ 14 00
Southern Coke, No. 3	13.00 @ 13.25
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	16.00 @ 16.50
Mahoning and Shenango Valley	17.50 @ 18.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2	18.50 @ 19.50
Forge.	
Gray Forge	12.50 @ 12.75
Mottled Neutral Coke	12.25 @ 12.50
Car Wheel and Malleable Irons.	
Southern Car Wheel	22.50 @ 23.50
Hanging Rock, Cold Blast	24.00 @ 24.50
Lake Superior Car Wheel and Malleable	21.00 @ 22.00

Rogers, Brown & Co. of Cincinnati announce that they have associated with them in partnership M. C. Armour, D. B. Meacham and W. C. Herron. Messrs. Herron and Meacham have been connected with the firm's business in the sale of Pig Iron for several years. Mr. Armour, late of Chicago, and having a wide acquaintance there, will have charge of the department of Steel, newly added to the firm's business.

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, February 4, 1891.

American Pig.—Current business continues light, buyers rarely purchasing beyond March and April delivery. Prices continue low. Product in the territory tributory to this market is apparently not falling off to any considerable extent, and the resumption of work at a number of Alabama furnaces is increasing the offerings, although the character of the grades made is not suitable for this market. We quote Northern No. 1 Foundry $16.75 @ $17.50; No. 2, $15.75 @ $16.50; Forge, $14.25 @ $15, tidewater, and Southern Iron, $15.50 @ $16 for No. 2, with low offerings No. 1 Soft.

Spiegeleisen and Ferromanganese.—The long spell of inactivity has been at last broken in Spiegeleisen by the purchase by an Eastern Pennsylvania Steel mill of several thousand tons of 10 % and 15 % at private terms. In Ferromanganese the foreign market is weakening, makers who have been holding off for a long time asking for orders. We continue to quote $61.50 @ $62.

Billets and Rods.—A new Eastern Rod mill is reported to have purchased a block of 2000 tons of Billets. Rods are quiet, maintaining the advance recently established. We quote $38.50 at Eastern mill.

Steel Rails.—There is some complaint that while the mills are asking $30 at works, second-hand lots are being offered at lower figures. The railroads are hold ing off, practically no sales being reported by Eastern mills, while from the West come reports of sales delivered in Colorado at $33.50. The agreement of the Rail makers has been signed by all of them, and it is expected to go into effect this week, as soon as the consolidation of the Scranton mills is ratified. The meeting of one of the companies was held on Monday, and that of the other will take place later in the week. The Pennsylvania order, which is variously estimated at 40,000 and 60,000 tons, has not yet come into the market, although it will probably be placed soon. Generally that event is the signal for extensive buying by other roads.

Manufactured Iron and Steel.—There is quite a fair run of business, but prices continue very low and unsatisfactory. A large building contract will be placed this week, and the bids are going in for a considerable quantity of new elevated work. It is reported that the last of this character was taken at 3.29¢ erected. The local trade is watching with a good deal of interest the movement for increased rapid-transit facilities. One of the plans for tunnels would call for an enormous amount of Cast-Iron work. In Bars we note the appearance of California orders. Plates continue very irregular and low. We quote Angles, 2¢ @ 2.10¢; Sheared Plates, 2.10¢ @ 2.25¢; Tees, 2.5¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 2.10¢ @ 2.30¢ for Tank, 2.4¢ @ 2.6¢ for Shell, and 2.6¢ @ 3¢ for Flange, on dock. Bars are 1.7¢ @ 1.9¢, on dock.

Old Rails.—The market is extremely dull. We hear of only one very small sale at a shade under the nominal quotation, which is $22 @ $22.50 for American Tees.

Warrant Stocks.—The American Pig-Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard, January 27, 1891	62,100
Put in yard for seven days ending February 3, 1891	500
Total	62,600
Withdrawn seven days ending February 3, 1891	1,100
Net stock in yard, February 3, 1891	61,500

The office of Carnegie Bros. & Co. and Carnegie, Phipps & Co. will be moved at an early date to the Bank of America Building, corner of Wall and William streets.

Metal Market.

Copper.—A quite heavy export business has been effected. Particulars are not made public, but a few facts come to the surface indicating that probably 8,000,000 lb Lake Superior product and at least 1000 tons of Montana Matte were involved. The Lake Copper, it is stated, could not have been placed except at better than 13¢ here, and the rumor is that the sales were at that price. The Montana Matte, to all accounts, went at about 10/ ℔ unit in Liverpool. On home-trade account there appears to be no important movement. Consumers are reluctant to place orders, except at lower prices than those generally asked. Brass manufacturers state that business in their goods is backward, and the demand for electrical supplies seems also to be tardy. It is stated, however, that a large order has been placed with a prominent manufacturer, and that other business is pending, which, if completed, will probably lead to freer purchases of Cakes and Bars. The large mining companies still quote 15¢, but small orders have been filled in some quarter at 14½¢ @ 14¾¢, and a Boston letter states that offers have been made at 14½¢. Arizona Ingot is quoted at 12¾¢ @ 13¢, but moves slowly. Casting brands have been sold at from 11¾¢ down to as low as 11⅝¢. It is stated that Matte at 10/ in Liverpool yields a better return than the refined article at 11½¢ here. This may account in some degree for the free selling of the former.

Pig Tin.—Prices have declined about .20¢ ℔ lb in this market under the influence of a fall of about £1. 10/ ℔ ton in London. The change in the statistical position during the past 30 days doubtless accounts in a good measure for the depreciation in values. The visible supply for Europe and America is shown to have increased from 12,294 tons on January 1 to 13,065 tons February 1. Spot stocks in this country are about 500 tons greater than they were a month ago, and the quantity afloat is only 230 tons less. England, it is estimated, has a sur-

plus that can be put where it will do the most good. Shipments last month from the Straits were 3150 tons to Great Britain and America, and 525 tons to the Continent, against 1650 tons and 350 tons respectively in December. In this market there were sales of Straits Tin in 10-ton lots at $19.90, net cash, on Tuesday and early on Wednesday, but London cables noting 10/ improvement promoted a better feeling, and 35 tons were subsequently sold at 20¢ for February delivery. At the close there were no sellers at less than 20.10¢, net cash, and 20¢ was bid. Jobbing quantities were quoted at 20¼¢ @ 20⅜¢, as to terms.

Pig Lead.—Operations in this metal have been on a very moderate scale, and the situation is practically the same as it was a week ago. There is no greater urgency in the offering, nor do buyers manifest more active interest. Sellers' ideas of minimum value are about 4.35¢ for prompt and 4.40¢ for near future delivery. There are buyers at 4.30¢ and 4.35¢, respectively, but bids are rarely for other than moderate-sized lots.

Spelter.—No improvement has been shown in the demand from either galvanizers or brass manufacturers, but offerings are hardly as urgent now as they were during the latter portion of last month. Prime Western may be secured in carload lots at 5.20¢ for near future shipment. Bids of a higher price than 5.10¢ are the exception, however, and the movement is slow.

Antimony.—Cookson's has been offering at 18½¢ cash in 5-cask lots and 18¼¢ @ 18⅜¢ in smaller quantities, showing a weaker market. Hallett's is comparatively firm however, with 16¼¢, a very close rate, and 16½¢ @ 16¼¢ generally quoted.

Tin Plate.—Although not as large the past week as during the week preceding, the sales of plates for future delivery have been quite large, and stiff prices have ruled all along the line. Spot business is comparatively light at the moment, but at stiff prices. Quotations for large lots on the spot are as follows: Coke Tins — Penlan grade, IC, 14 x 20, $5.40; J. B. grade, do., $5.55. Bessemer do., @ $5.50; Siemens Steel, $5.60. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.65; Siemens Steel, IC basis, $5.75; IX basis, $6.75. IC Charcoals — Melyn grade, $6.25; for each additional X add $1.50; Allaway grade, $6; Grange grade, $6.12½; for each additional X add $1. Charcoal Ternes — Worcester, 14 x 20, $5.65; 20 x 28, $11; M. F., 14 x 20, $7.75; do., 20 x 28, $15.50; Dean, 14 x 20, $5.25; do., 20 x 28, $10.50; D. R. D. grade, 14 x 20, $4.90; do., 20 x 28, $10; Mansel, 14 x 20, $5; do., 20 x 28, $10.10; Alyn, 14 x 20, $5.12½; do., 20 x 28, $10.25; Dyffryn, 14 x 20, scarce; do., 20 x 28, $10.50. Wasters—S. T. P. grade, 14 x 20, $4.80; do., 20 x 28, $9.62½; Abercarne grade, 14 x 20, $4.80; do., 20 x 28, $9.50.

The Matthiessen & Hegeler Zinc Company of La Salle, Ill., issue a new price-list and discount sheet of Sheet Zinc, under date of January 28, 1891. The only change made in the list, which was published in full in *The Iron Age* of December 25, 1890, page 1139, is in the base price, which has been reduced from $6.75 to $6.25 ℔ 100 lb. The extras stand as before.

New York Metal Exchange.

The following sales are reported:

THURSDAY, January 29.

35 tons Tin, May ..... 20.25¢

FRIDAY, January 30.

10 tons Tin, May ..... 20.15¢
25 tons Tin, April ..... 20.10¢

SATURDAY, January 31.

25 tons Tin, delivery 1st half February 20.05¢

TUESDAY, February 3.

20 tons Tin, March ..... 19.95¢
10 tons Tin, June ..... 20.00¢
10 tons Tin, May ..... 19.95¢

Coal Market.

The Anthracite Coal trade remains in the conjested condition noted for some time past, so that weak prices are the inevitable result. Collieries have been closed in several instances and at others work has been temporarily suspended without any appreciable decrease in the aggregate production. For the week ending January 24 the total was 684,800 tons, as compared with 500,000 tons for the corresponding week last year, and since January 1 the total is 2,425,000, an increase of 523,500, compared with 1890. Reading's tonnage was 145,000, of which 30,000 was sent to Port Richmond and 15,000 to Port Liberty. Current prices are about as last reported, viz.: Stove, $3.80, f.o.b.; Broken, $3.40; Egg, $3.50; Chestnut, $3.30 or $3.50 alongside; Pea, $3; Buckwheat, $1.90 @ $2. The Pennsylvania Railroad's tonnage was 287,000 tons, and for the year 924,500 tons, the latter an increase of 100,600 tons.

Coke and Bituminous Coal are in active demand, and New England manufacturing demand is reported good. According to Philadelphia papers, tho reorganization of the Beeck Creek properties in the interest of the Vanderbilts will soon be effected. The Lehigh Valley Railroad will hereafter handle the Coal traffic of the Philadelphia and Reading Railroad Company between Bound Brook and Perth Amboy, until the completion of the Reading's new Port Reading branch. The Huntingdon and Broad Top Mountain Railroad annual report for the year ending December 31, 1890, shows that 563,852 tons of Coal were shipped from the Broad Top region and 1,477,792 tons from the Cumberland district, being an increase of 177,025 tons from the former and 578,172 tons from the latter.

Advices from the Connellsville Coke region indicate that the conference between operators and miners held 2d and 3d inst. was unavailing, and that a strike of 16,000 men may be protracted. The men insist upon an advance of 12½ per cent., and the operators demand a 10 per cent. reduction, with certain other restrictions in regard to loading cars. The operators claim that the depressed condition of the Coke and Iron trade will not justify even the wages paid during the last year, and say they prefer to close down their works.

The Grand Trunk invited bids for 735,240 tons of Coal, 560,000 tons to be delivered at Suspension Bridge.

The drawing of colliery prices of Anthracite Coal, on which miners' wages are based in the Schuylkill region, was for January, 1891, 2.33^{9}/_{16}$ against 2.35^{1}/_{16}$ in December, and 2.37^{5}/_{16}$ in January, 1890.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Arms, cs., 19; Chains, cks., 9
Botany Worsted Mills, Mach'y, cs., 2
Barbour Bros., Mach'y, cs. and pgs., 52
Field, Alfred & Co., Mdse., cs., 10
Graef Cutlery Company, Cutlery, cs., 3
Sumner, C. P. & Co., Mach'y, pgs., 4
Thompson, L. & Co., Sewing Machines, cs., 62
Wittemann Bros., Metal Goods, cs., 67
Woodruff, J. A. & Co., Mach'y, cs., 57
Order—Mach'y, pgs., 55; ditto cs., 28; Pots, 1240; Ovens, 288

The report that the Crane Iron Company's plant has been sold at the figures named in the dispatches of the daily newspapers ($3,500,000) is not credited in the trade.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, February 4, 1891.

Scotch warrants sold down early in the week to 46/3 under the influence of rumors that a number of furnaces are likely to re-start in a short time. Subsequently prices reacted a fraction, but the buying is light and cautious despite the fact that several brands are known to be absorbed. There is a large "short" interest outstanding, but the "shorts" are confident and make no effort to cover. Their confidence is due to information that several furnaces will start up during the next fortnight. A general relighting is not looked for, although the collapse of the Scotch railway strike has already helped to improve trade. Latest transactions in Scotch warrants were at 46/4 @ 46/6, Cleveland weakened to 41/7½ @ 41/9 and Hematite to 51/9 @ 51/10

The Block Tin market has been dull and weak. Realizations caused a decline in prices to £89. 5/ for spot. The selling included a considerable amount of old holdings, besides trading on "short" account, due to heavy arrivals from the East and the reported large shipments last month, Prices a shade better at the close, but demand irregular.

Copper was firm early in the week, but the market subsequently turned on reports of further heavy sales of American Matte at 10/. The scarcity of cash warrants has been relieved by exchange of the same for three months' futures. These exchanges indicate that holders of warrants are inclined to avoid taking up Copper for the present. Sales of furnace material during the last half of January included 200 tons Anaconda Matte at 10/; 1500 tons Anaconda Argentiferous, private terms; 100 tons Montana Matte on spot, and 750 tons ditto, to arrive, at 10/1½; 200 tons ditto at 10/; 300 tons ditto, at 10/3, and 200 tons Anaconda Matte, at 10/1½. European stocks of Copper decreased 3494 tons last month.

The Tin-Plate market is firm. Late advanced prices are maintained, and a further large business has been done. Several idle works are about to be restarted.

Prices for Steel Ship Plates are slightly weaker at £6. 5/, and makers' Rails, Billets, &c., at some concession, but the lower prices fail to stimulate business.

Scotch Pig Iron.—The situation of the market for makers' Iron is unchanged, demand being moderate.

No. 1 Coltness,	f.o.b.	Glasgow	..
No. 1 Summerlee,	"	"	..
No. 1 Gartsherrie,	"	"	..
No. 1 Langloan,	"	"	..
No. 1 Carnbroe,	"	"	52/
No. 1 Shotts,	"	at Leith	..
No. 1 Glengarnock,	"	Ardrossan	..
No. 1 Dalmellington,	"	"	59/6
No. 1 Eglinton,	"	"	59/

Steamer freights, Glasgow to New York, 2/: Liverpool to New York, 10/.

Cleveland Pig.—No improvement in the demand and prices still rather weak. Makers quote at 42/ for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Orders are still running light and prices are barely steady.

Makers quote 53/6 for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—There is little doing at present and prices remain without change. English 20 % quoted at 97/6, f.o.b. shipping port.

Steel Rails.—New business is light and prices are rather weaker. Heavy sections quoted at £4. 05/ and light sections £4. 12/6 @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Demand is very slow and prices tend in buyers' favor. Makers offer at £4. 10/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The improvement is slow, and prices are rather weak Bessemer, 2½ x 2½ inches, £4. 15/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Very little movement and prices nominal, with Bessemer quoted at £4. 15/, f.o.b. at N. W. England shipping point.

Old Iron Rails.—The market is unsettled and prices are irregular; buyers and sellers far apart. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 2/6 @ £3. 5/, f.o.b.

Scrap Iron.—Sales are light and the market is rather weak. Heavy Wrought quoted at £2. 5/ @ £2. 7/6, f.o.b.

Crop Ends.—A very slow business and prices nominal. Bessemer held at £3 @ £3. 2/6, f.o.b.

Tin Plate.—The demand less active to-day, but the market remains firm. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	19/3 @ 19/6
IC Bessemer Steel, Coke finish	18/ @ 18.6
IC Siemens " " "	18.3 @ 18/9
IC Coke, B. V. grade	17/9 @ 18/
Charcoal Terne, Dean grade	17/6 @ 17/9

Manufactured Iron.—Demand has continued slow and prices are still rather weak, with a further decline on Black Sheets. We quote, f.o.b. Liverpool:

	£ s. d.		£ s. d.
Staff. Marked Bars		@	8 10 0
" Common "		@	6 10 0
Staff. Bl'k Sheet, singles		@	7 0 0
Welsh Bars (f.o.b. Wales)	5 17 6	@	6 0 0

Copper.—The market steady at the close, but quiet. Merchant Bars quoted at £52. 2/6, spot, and £52. 12/6, three months' futures. Best Selected, £58. 10/.

Tin.—Market firmer to-day on covering of "short" sales. Straits sold at £89. 10/ @ £89. 15/, spot, and £90 @ £90. 5/ for three months' futures.

Lead —Very moderate trade passing; prices barely steady at £12. 10/ quoted for Soft Spanish.

Spelter.—The market steady, with demand fair. Sellers quote at £23. 5/ @ £23. 7/6 for Ordinary Silesian.

A bill has been introduced in the Michigan Legislature to increase the specific tax upon the output of the Upper Peninsular mines. The tax on iron ore is now 1 cent per ton of 2240 pounds and on copper ore 75 cents per ton. Senator Doran is the leader in the movement for increasing the tax and calls special attention to the large dividends of the Calumet and Hecla Copper Mining Company, while the company pay but a light tax to the State on their output.

Financial.

The events of the week have been conducive to a better feeling in business circles, chiefly by reason of the lessened apprehension of mischievous legislation, the free coinage question seeming to have been at least temporarily put to rest, and an extra session of Congress is no longer thought of as probable. Nevertheless, if the Committee on Coinage fail to report the Senate Silver bill speedily, Mr. Bland may make an effort to bring it directly before the House. The lamentable death of Secretary Windom caused no disturbance in monetary affairs. On the contrary, that event and the very effective speech which preceded the tragic occurrence made it certain that the Senate bill cannot become a law. The withdrawal of goods in bond under the old rates of duty was completed on Saturday, without difficulty of any kind. The improvement in the financial situation is further evidenced by the lowering of the Bank of England rate of discount to 3 % and the growth in its reserve, and by the increased resources of the New York banks. Respecting the new railroad agreement a Chicago dispatch says the territorial divisions have now been arranged, and the six commissioners will now address themselves to the more delicate task of arranging the percentages by which competitive traffic is to be derived. The Chilian outbreak has led to the conclusion of arrangements by which producers of nitrates will cease to manufacture the product during five months of the year, and a syndicate is being formed to control prices. Eastward freight tonnage from Chicago is in diminished volume. Jordon, Marsh & Co. of Boston will test the legality of the McKinley bill. Banking troubles in Kansas indicate serious local derangement, but the effects are not discernable in Eastern cities, whence the funds were in large part originally derived.

The stock market has been dull and barely steady. The bearish attitude of the West was in part attributed to the winding up of the United States National Bank of Atchison, Kan., whose capital is said to be impaired one-half. The only influence which the death of Secretary Windom had upon the market was indirect. In London there was a sharp fall in silver, which was reflected here in a decline in silver bullion certificates. The interest felt in Richmond Terminal was hightened by the departure of the Goulds and prominent directors, ostensibly on a tour of inspection. On Monday Manhattan Elevated rose on the statement that the directors had authorized the purchase of the Suburban Transit, extending to Fordham and the adjacent country.

Government bonds are steady at the following quotations:

U. S. 4½s, 1891, registered	101⅞
U. S. 4½s, 1891, coupon	103
U. S. 4s, 1907, registered	120
U. S. 4s, 1907, coupon	120
U. S. currency, 6s, 1895	109

The weekly bank statement showed a slight decrease in reserve, which now stands at $23,943,000. The special feature was an increase of over $4,000,000 in loans. Withdrawals of goods in bond February 1 caused a transfer of at least $3,000,000 to the Treasury, the receipts for customs having exceeded $1,000,000 a day. It is now believed that money will rule at a low rate for some time to come, in which case it is thought not improbable that there must be a readjustment of the value of income bearing securities, which for a long period have been selling upon the basis of a 6 % money market. The tendency of the money market is now as decidedly toward low rates as it was toward stringency during 1890. Commercial paper was in good demand for first class, but low-grade names were difficult to sell. The supply was not abundant and rates were 5 % for 60 to 90 day indorsed bills receivable.

The merchandise markets were generally slow. Flour was in demand for export, considerable quantities being taken from the mills for direct shipment. Spot wheat was wanted at an advance, part of it for shipment on the opening of lake navigation, and spot corn was up. Coffee without animation. Spot cotton firmer at the close. Provisions dull. Raw sugar steady. India rubber strong at a higher range of values. Dry goods jobbers realized a fair trade for the time of year, and reports from Western sections were of the most favorable character. In the South the situation was not so flattering. Bank clearings indicate a volume of trade about the same as a year ago. Fifty-eight cities show a decrease of 15.4 %, but outside of New York only 0.6 %, the loss in New York being due to small stock operations. New York decreased 23.5 %; Boston 12.8, Philadelphia 13.8, Louisville 30.7, St. Paul 10.8, Memphis 23.4, Duluth 23.3; Chicago increased 15.4, San Francisco 24.4, Galveston 182.1, Minneapolis 42.6, Dallas 141.6, Portland, Ore., 38.5, Seattle 57.7, Tacoma 96.3. Other changes were less important.

Sterling exchange was dull and firm; posted rates $4.86 @ $4.88. London bankers received Mr. Goschen's pound-note proposals with decided aversion, but if associated with an issue of 10-shilling silver notes the project would find large support in Parliament.

The Mechanics' and Traders' Exchange has elected these officers for one year: President, William C. Smith; vice president, George Moore Smith; treasurer, Edmond A. Vaughan; secretary, Stephen M. Wright.

Inquiry among the trust companies' savings banks and others loaning money on mortgage shows that in some instances the gold clause is insisted upon, but some corporations do not refuse to take good security on a silver basis. While gold has always been recognized as the standard, there is yet no uniform practice, nor is there likely to be until the prospects of passing a silver bill are more distinctly defined.

The Prosperity Harrow Company, have been organized at Prosperity, S. C., with a capital stock of $100,000. J. M. Wheeler is president, H. S. Boozer, secretary and treasurer, with the following as directors: J. M. Wheeler, W. H. Wheeler, A. M. Wise, H S. Boozer, A. H. Cohn and L. S. Bowers.

J. K. Zollinger, engineer and secretary of the Rich Patch Iron Company of Rich Patch, Va., reports the development on the property of his company as going on very satisfactorily.

Engineer-in-Chief Melville and other naval officers on Saturday witnessed the pouring of a 75,000-pound casting at the Bethlehem Iron Company's ordnance works at Bethlehem, Pa.

An iron hull pilot boat for Brazil has been contracted for by the Busey & Jones Company of Wilmington.

It is rumored that George M. Pullman has purchased the plants and the stock of the United States Rolling Stock Company, the works being at Hegewisch, Ill., New Decatur, Ala., and Anniston, Ala.

The appropriation of $1,000,000 for oil tempered and annealed steel for high-power coast-defence guns was reduced to $800,000.

HARDWARE.

Condition of Trade.

MANUFACTURERS generally report that business is opening satisfactorily, and refer to the indications as pointing to a large trade. It is quite generally remarked that the margin of profit at present prices is narrow, but this is being accepted as the natural condition. Changes in price during the week have been few and unimportant. Reports from jobbing houses are to the effect that travelers are sending in fair orders, it being rather early for their business to assume large proportions. The reports from the retail trade are, however, gratifying, there being a good business in nearly all sections. Collections are generally referred to as reasonably good, with little cause for complaint.

Chicago.

(*By Telegraph.*)

January closed with a record in Heavy Hardware much ahead of anything previously done here in that month. The demand for such goods comes from all parts of the Northwest, not excepting localities in which there has been considerable complaint of short crops. Wagon Wood Work is constantly growing scarcer and prices are, therefore, still advancing. In Shelf Hardware a steady improvement is noted as the salesmen get down to work, but it is yet somewhat early in the year to expect a heavy trade in this line. Staple goods are, however, moving very freely, especially Nails and Barb Wire. The advance in Steel Billets and Wire Rods has caused a stiffening up of prices, which is meeting with a quick response from the trade. Tin Plates have advanced 50 cents on large sizes and 25 cents on small sizes, both of Bright and Roofing Plates. Prices of Strap and T Hinges have been advanced by jobbers to correspond with the advance made by manufacturers. Collections are very good. A hearing is to take place next Tuesday on the mixed carload question with special reference to Nails and Fence Wire. Protests have been made to the railroads against the new regulation on the ground that the custom of mixed carloads had been so long established that it had practically become a vested right in a business way, and that as it harmed no one, its abolition introduced needless friction.

St. Louis.

(*By Telegraph.*)

The Hardware trade for the month of January has been gratifying in the extreme. Prices have been well maintained, and the tendency has been toward improvement in this direction. Since the opening of the year the cold snap has created a lively demand for Snow Shovels, Sleds, Sleigh Bells, &c. Building Tools and Material are quiet, but jobbers are stocking up in anticipation of a large spring trade. Nails are slow to move, while Wire Nails are in active demand; the latter are quoted at from $2.35 to $2.40 for lots from store. Painted Barb Wire is quoted at $2.85.

Boston.

BIGELOW & DOWSE.—January is gradually displacing the month of December as a time for stock taking, and where many jobbers and retailers formerly took their account of stock to January 1, they now find it more convenient and better every way to have the business year end on January 31. Formerly December was the dullest month of the year; now January takes its place. The volume of business the past month has been good and many orders have been placed for future delivery. The action of the manufacturers of Barb Wire and Nails has stimulated business, and it seems to be a settled fact that prices are very low and advances may be looked for. The retailers will want a week or ten days to figure stocks and arrive at the results of the past year, and then we may look for a marked improvement in general business.

Baltimore.

CARLIN & FULTON.—In the month of January just passed we have experienced but very little worthy of comment. We suppose that sales have generally footed up about equal to those of last year, and collections have been about as good, but there has been lacking that vim in business which we would like to see. At this particular season in the far South the sales are mostly those of heavy staples, which increase the volume of business more than its profits; while the purchases by the near trade are made very cautiously and mostly of goods which go into consumption at once. The slight advance in Strap and T Hinges indicates renewed harmony among the manufacturers, and as the low prices at which these goods have been sold have undoubtedly been very unsatisfactory, we would not be surprised to see this cordial feeling grow and possibly the discounts to the trade diminish. The Eastern Nail manufacturers mention a recent advance in Steel as a reason why they should obtain belter prices for Steel Nails, which argument would be greatly strengthened were the demand somewhat increased. From present indications we think that there will be a good demand for Hardware as the spring approaches, and as there is but little room for depreciation in values, the trade can run but little risk to take advantage of present prices.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Business is fair, with not only hopeful, but bright prospects for the future. We think the above gives an idea of the present situation in our city. During the last two weeks a moderately increased activity has prevailed. Although the season did not open with large orders for a general line of Hardware, yet orders have been and are being placed for leading articles and seasonable goods like Wire Nails, Barb Wire, Lawn Mowers, Poultry Netting, Wire Cloth, Agricultural Implements, &c., for future shipments; besides moderate-sized orders are coming in for immediate shipments on Shelf Hardware from different points, and trade shows signs of improvement in volume. When January 1 opened it was comparatively an exceptional season, owing to the recent financial tightness in Eastern cities. The result was not felt so much throughout the country, but it did send a cloud of caution, it not of fear, through the country. The consequence was that salesmen started out and found their customers not over anxious to purchase, unless it was on leading goods, which they knew they would need when the season opened. The outlook, however, has become more cheerful within the last few days. There is also less alarm respecting unwise tinkering with financial matters by Congress. How often we hear the remark that if Congress would only adjourn after making the necessary appropriations for the Government, and not assemble for the next two years, how much better off the country would be. They feel that were it not for legislation in Washington during the last few weeks it ss fair to presume, from apparent facts, that the country would again be upon the level of prosperity shown in 1890 before the financial disturbance was wafted from foreign shores. The growth of industries, especially in the iron-producing States of the South, has been marvelous. The cotton crop has been abundant, the wheat crop large and sold at remunerative prices.

The volume of currency in circulation at the present time is far in excess of what it has been heretofore, with an increase in circulation January 1, 1891, over January 1, 1890, of many millions, and the only apparent signs of prevailing fear have been caused through aspiring politicians, who have been agitating unpopular legislation in one instance, and in another advocating a change of financial values, which the mercantile and industrial communities look upon with fear and trembling. This would enrich the mine owners who are fortunate enough to get rid of their property before the financial ruin reached them, but those who are engaged in industrial, manufacturing or mercantile pursuits breathe more freely as the chances for the passage of such a law are diminishing. The prospect is that those who have delayed new projects, owing to the unsettled monetary values, against which the business men and manufacturers have protested, and the financial institutions have shown their fear of the danger of those unsettling values, the statesman, whose experience of financial affairs has given words of warning against enforcing

this scheme, which would again send gold at a premium, and perhaps deplete our treasury of the same, while it might temporarily advance merchandise values, as it would temporarily advance the price of silver, and those who have their investments of hard-earned money in manufacturing or industrial pursuits, who employ hundreds and even thousands of men, to-day breathe a little more freely.

The recruperative power of our country from financial stringency has never been more fully exemplified than during the last few months, while we learn from authentic sources that over 100,000 men are out of employment in London alone. Yet with this surplus of idle labor, the officials report the North British Railroad Company working their men a minimum of 14 hours to a maximum of 18 hours per day. Further we learn that, in order to relieve Ireland, they have started new lines of railroads, in order to employ the distressed, but the payments made are from $2.50 to $3.25 per week. During the entire winter our manufacturing industries have bravely faced the monetary stringency, especially in order to keep the men employed, and without any reduction in wages; have been willing to run the risk of the depressed market for their goods when the season of 1891 opened. The financial situation has materially improved as far as accumulation of funds in the hands of the banks and trust companies in our city, and the willingness to further accommodate their customers is apparent; while paper is yet scrutinized, nevertheless two named paper is readily discounted. What is looked upon as two-named paper is not accommodation paper, but legitimate mercantile two-named paper. The country merchant in many cases does not understand why, if his account is due and payable, yet through some cause, either from collection or otherwise, he is unable to make remittance, he is asked to send note in settlement of account. This request is made that his over due account may be made temporarily available in bank, and yet the fact is that this is frequently misunderstood by customers throughout the country. Prices remain without any material change. Strap and T Hinges are a trifle stiffer. Barb Wire and Wire Nails are held firm. Wool and Cotton Horse and Curry Cards have advanced in price.

Cleveland.

The W. Bingham Company.—If January is to be any criterion for the balance of this year, there will be no cause for complaint by Hardware jobbers so far as the quantity of business is concerned; the quality, however, is somewhat below par. There has been a decided strife among the merchants and manufacturers alike to see who could give the most for the least money. Nails and Wire have taken the lead in this respect, and prices reached at one time, a point never before heard of. A reaction has come, however, and a decided stiffening on both these lines is apparent, with good prospects of still further advances. Nails are now quoted $2.20 rate for Wire and $1.75 for Cut, from stock; Plain Wire on a basis of $2.20 for No. 9, black; Barbed Wire, Painted, $2.70; Galvanized, $3.20 The action of the railroads in no longer taking a mixed car of Wire and Nails at carload rates we think is as it should be, and will have a tendency to strengthen prices on these commodities. The retail trade through out the city is excellent. During the holidays and early part of January we had some real, old-fashioned winter weather, and the skating craze attacked both old and young. The consequent demand for Skates was phenomenal, and stocks which have been carried for the past two seasons were rapidly depleted. "Old Prob." has gone back on the enthusiasts, however, and for the past two weeks has given us weather more suitable for April, and the demand for Skates is no more. Financial matters have about assumed their normal condition, and are in a much healthier state than they have been for some time past. Collections are good.

St. Paul.

Farwell, Ozmun, Kirk & Co.—We have to report largely increased sales in January over last year for the same period. Collections are much better than usual at this time of the year and are very satisfactory. Many country merchants are taking advantage of the low prices prevailing on Staple Goods, having bought early, and in many cases are taking advantage of cash discounts. Shelf Hardware is also active. The recent fall of snow in the Pineries will very materially help out the lumbermen in their work and insure a large output for this season, which will have a favorable effect on all branches of the trade.

New Orleans.

A. Baldwin & Co.—We are in the midst of our spring business and must report trade fully up to last season's business, with a decided improvement in collections. Our city is filling up with strangers, coming up to our Mardi Gras festivities, and of course an improvement in spot trade is noticeable.

Louisville.

W. B. Belknap & Co.—Business continues to develop gradually in increasing volume. While the market is devoid of all speculative features, unless it be a small flurry in Wire and Wire Nails, there is a good, strong, steady demand for all staples, which would go to indicate an undiminished consumption in the country. Some of the more recent and less well defined essentially boom enterprises have been checked or sunk out of sight, but all of those which had a fair basis for their existence are now being taken hold of again by their promoters and owners, and there is every prospect that our own State of Kentucky and those immediately south of us will receive a fresh impetus by reason of further addition of foreign capital, which is being put in to develop natural resources. The magnificent lumber and coal of Eastern Kentucky are receiving special attention and have promise of still more. The fine open winter which we have had, with cool, frosty weather, but with little in the way of intense cold and wet, has permitted the continuance of outdoor work almost uninterruptedly. This, itself, is a great source of wealth to this section of the country. Manufacturers seem well supplied with orders—in fact, on some classes of goods deliveries are as difficult to obtain as we ever knew them. While the productive capacity of the country is undoubtedly great, yet in many concerns there is a lack of system and organization in the distributing department which prevents the best results from being achieved. Rail freight rates are well maintained, and the large tonnage is being handled by the roads, which, compared with all previous years, continue to make a creditable showing. Collections are good, and the number of failures has notably fallen off since the first of the year.

Omaha.

Lee-Clarke-Andreesen Hardware Company.—A month ago business men were inclined to shake their heads dubiously and to look perplexed and grave when the subject of the future of trade was broached. Money was close and trade normal, but as the financial prospect brightened and gathered strength business men commenced to look forward to the first of the year as the turning point for the better. The first month of the new year has nearly passed, and while it is yet too early to form any exact idea of the correctness of the predictions made a few weeks since, it is self evident on every hand that the general feeling is at least for the better. The growth of this Western country even during a season of depression has been very satisfactory and gives evidence that there is no lack of confidence on the part of business men generally in the certainty of a good business through the spring months at least. Traveling salesmen are sending in a satisfactory volume of orders both for present and future delivery, and the output for January will compare favorably with corresponding month of previous years. It is conceded by the trade generally that as far as prices are concerned the bottom has been touched in nearly all lines of Hardware. No further shrinkage in values is expected, and this fact alone is the best possible basis on which to start a new year.

Portland, Ore.

Foster & Robertson.—A trip of ten days through the great wheat-raising districts east of the Cascade Mountains discloses a remarkable situation. Strange as it may seem, the merchants of the "Inland Empire" and "Palouse Country" are more deeply in debt to-day, in spite of the last season's immense crop of grain, than they were a year ago. It is not an easy matter to account for this state of affairs, but it doubtless arises in a great measure from the fact that the farmers were tempted by the fine outlook for large crops to be extravagant in the purchase of machinery. For this machinery they gave indorsed

bank paper; to meet this paper when due they were compelled to sell a goodly portion of their crop for less than the cost of raising, or else deposit the grain in the various warehouses along the road, taking therefor warehouse receipts, which they disposed of at a "shave," or deposited in bank as collateral for money borrowed at an excessive rate of interest. Although fully three times the usual amount of grain has already gone to market, there still remains fully as much more, which, when it moves, especially if a good price is realized, will have a tendency to greatly relieve the present financial stringency in that portion of our territory. The weather for the month now drawing to a close has been unusually pleasant and open—even dangerously so for the country east of the mountains,—for without a fair amount of snow in the mountains to temper the hot summer winds, there is great danger to the crops of the coming year. Still, it is probable that the month of February, as is generally the case, will bring us a bountiful supply and remove the danger. There has not been enough disagreeable weather to in the least interfere with outdoor work, and trade, as a natural consequence, has maintained about its usual activity. Prices remain about the same as they were at the close of the year, no changes of any moment having occurred, except a slight advance in the price of Common Rim Locks and a decline of about 1 cent per pound on Sisal Rope.

San Francisco.

HUNTINGTON-HOPKINS COMPANY.—At the date of our last report prospects were brighter than they seem to be now. This change has been brought about by the fact that the entire country has been swept for some time by a north wind, which has had a damaging effect upon young grain, which had just begun to make its appearance; and, unless we are favored quickly with a rain, the damage is liable to be widespread. However, we must state that in the face of this apparently discouraging outlook trade has kept up; but we cannot look for its continuance for a much longer time unless rain comes. Collections are still a little slow.

Notes on Prices.

Wire Nails.—There has been a good deal of activity in this line, and manufacturers are well supplied with orders. The advance which has taken place in the price has had the effect of stimulating the demand. While the market is characterized by a firm and confident tone, there has been no further change in quotations at mill, $2.15 being a general price on carload lots. Some manufacturers refuse to sell at less than $2.25. Small lots from store in New York are held at $2.45 to $2.50.

Chicago, by Telegraph.—The bottom rate now quoted by Wire Nail makers is $2.25 at Chicago. Some ask more. The demand for mill lots is reviving. Large buyers have been running off their stocks so rapidly of late that they are obliged to come into the market again, although they were supposed to have been stocked up for months. Jobbers have again advanced store prices and now name $2.35 for small lots, with 5 cents off for carloads, and are very firmly holding their price.

Cut Nails.—During the week there has been a fair demand and the market is in a somewhat better condition. Prices are being adhered to rather more firmly. Quotations in New York market are $1.80, f.o.b. New York, for carload lots of either Iron or Steel Nails. At mill quotations for carloads with 30 or 35 cent average are on a basis of $1.60. Small parcels from store in New York are quoted $1.85 @ $1.90 for Iron, with the usual advance for Steel.

Chicago, by Telegraph.—Cut Steel Nails are in better demand, and manufacturers are receiving numerous orders. The Wheeling makers now insist that $1.60 at mill is their bottom rate for a 30-cent average. Jobbers quote $1.85 from store, with 5 cents off for carloads.

Barb Wire.—The market continues in the somewhat improved condition noted last week, and reports indicate that manufacturers are doing a very satisfactory business at prices slightly higher than prevailed a few weeks ago. Quotations are still on the basis of 3.10 to 3.15 cents at mill for round lots of Galvanized Four Point, Painted being 50 cents less per 100 pounds. Small lots in New York are quoted at 3.35 to 3.45 cents for Galvanized.

Chicago, by Telegraph.—The large stocks held by all manufacturers 60 days since have not only been cleaned out, but they are now behind their orders, thus completely reversing the situation. The very open weather, which has enabled outdoor work to be carried on, has had an important influence on the situation. The jobbing trade has been very heavy, and while quotations continue at 2.75 cents Painted, and 3.30 cents Galvanized, with 5 cents per 100 pounds off for carloads, it would not be unexpected if they advanced their rates at least 5 cents per 100 before the close of the week.

Cartridges.—Important action, which was unexpected by the trade at large, was taken by the Associated Ammunition Manufacturers at their meeting yesterday. By this action a change was made in their prices, which are hereafter to be the same to all classes of trade, the system of having contract houses and agents being abandoned. As a result the general price remains as before, with an additional 10 per cent. discount. The cutting of prices by leading houses, and irregularities which had crept in, are understood to be the reason for this departure.

Turkey Oil Stone, Hones, &c.—Ghelfi & Droescher, 56 Warren street, New York, are importers of Turkey Oil Stones, which they advise us they sell at figures closely approximating the present prices of Washita. They also refer to their Turkey Stones as of such quality as to retain their hold on the market wherever used, having a close fine grit and giving a smooth edge. They are also quarriers and manufacturers of Razor Hones, of which they carry a large stock; and, with reference to their assortment of these goods, refer to the experience of their Mr. Ghelfi as enabling them to place on the market a superior line of goods. The following are their prices on Belgium Razor Hones, Escher's Water Hones, Turkey Oil Stones, &c.:

Razor Hones.

Sizes in inches	5	6	7	8
Extra selected, doz.	$2.50	$4.50	$7.50	$15.00
Extra fine selected, doz	2.00	3.00	5.50	12.00
Superfine, doz.	1.50	2.50	5.00	10.00
Fine, doz.	1.25	2.00	4.00	7.50
Half fine, doz.	1.00	1.50	3.00	4.50
Common, "	.75	1.00	1.50	3.00

Sizes in inches	9	10	11	12
Extra selected, doz.	$24.00	$32.00	$40.00	$48.00
Extra fine selected, doz.	18.00	22.00	36.00	42.00
Superfine, doz.	15.00	20.00	30.00	...
Fine, doz.	12.00	18.00	....	....
Half fine, doz.	9.00	....	....	....

Escher's Water Hones.

Sizes in inches	7	8	9	10
Blue Green, doz.	$2.00	$2.75	$3.25	$4.00
Light " "	2.50	3.25	4.50	5.00
Yellow " "	3.00	4.00	5.00	6.00

Genuine Turkey Oil Stones.

Extra selected, 5 to 9 inches, per pound....35¢
No. 1, 5 to 9 inches, per pound.....30¢
Turkey Slips, 60 cent per pound, or per dozen.....$1.75
Vienna Emery Scythe Stone, per 1000.....$45
Knife Sharpeners, per 100.....$15
Indispensable Knife Sharpener, per gross $16 to $20
Pen-Knife Pieces, Grecian, per dozen.. 4-inch 60¢ and 5-inch 80¢

Shot.—No change has been made since our last report by the associated manufacturers of Shot. The following are the prices announced by Globe Shot Works, 634 Pemberton street, Philadelphia, the prices given being subject to a discount of 5 cents per bag for cash on receipt of bill:

Drop Shot, per bag.....$1.41
" " ton lots, per bag..... 1.31

Steel Door Mat.—The Wire Goods Company, Worcester, Mass., announce a reduction in the price of their Elastic Steel Door Mat. The new list is as follows, subject to a discount of 10 per cent:

No.	2	3	4	5	6	7
	$1	$1.50	$2	$3	$4	$4.50

Special sizes, 40 cents per square foot. It is expected that this important reduction will give this Mat a much larger sale.

Strap and T Hinges.—Further conferences between the manufacturers are in progress with a view to bringing all into the combination and securing, if may be, better prices. The advance thus far made is but slight.

Saws.—C. E. Jennings & Co., 79 Reade street, New York, issue a condensed price-list of Hand, Panel, Rip and other Saws. The whole list is subject to a discount of 25 per cent., except Griffin's Patent Bracket Saw Blades, Hack Saws, Piercing or Jewelers' Saws, Framed Wood Saws and Billet Webs or Wood Saw Blades, which are subject to a discount of 40 and 10 per cent.

Miscellaneous.—The Never-Slip Horse Shoe Company, 36 India Wharf, Boston, Mass., quote their Never-Slip Cork *Horse-Shoe Pads* at the following prices to the trade:

Less than one dozen pairs, per pair..... $0.60
One dozen pairs or more, " " ..... .50

They issue circulars describing these goods, and refer to the fact that since they became manufacturers of these Pads in March, 1889, the demand and sale for them has steadily increased. Their quality and merits are also referred to.

Russia Cement Company vs. the Le Page Company.

THE CASE of the Russia Cement Company against the Le Page Company for infringement of trade-mark, which was on trial in the United States Circuit Court, Judge Nelson presiding, was concluded last week, and a decision was rendered in favor of the plaintiffs, with an award of $8000 damages. The following extract from the charge of the judge to the jury may be of interest, touching as it does upon points of trade-mark law:

The conclusion which the court has come to upon one branch of this case will relieve you from that part of the case, at least, and any difficulty in determining it.

It appears here from the undisputed evidence that some years ago a copartnership was formed under the name of the Russia Cement Company, of which Mr. William N. Le Page was a member, in Gloucester, for the manufacture of fish glue; and that that concern, with Le Page's consent, adopted as a trademark to designate its goods, the word "Le Page," which was part of Le Page's name; and that this partnership was afterwards dissolved and a corporation formed under the same name in Gloucester, and all the property and rights of the old company, including the right to use all tradesmarks which the old company had or used, passed to this new company, which is the present plaintiff. And it appears that both the copartnership (Le Page still continuing a member of the new corporation), and the corporation spent a great deal of money in advertising their manufacture, and that this glue which they made became known throughout the market of the country as Le Page's Glue.

Now there is no doubt whatever that under those circumstances the plaintiff owns this tradesmark to designate its glue which it manufactured, and that no person had a right to infringe upon it or make use of it either directly or indirectly. No person by getting up a company, or the name of a company, could make use of that company to carry on the glue business, and use that name upon its labels and to aid itself, if the effect of that was to indicate to the world that the goods manufactured were the goods which were known as Le Page's Glue, which had been manufactured by the plaintiff.

Now that is what Mr. Le Page has apparently done here, by the admitted evidence. He has organized a company for the manufacture of glue and has called it the Le Page Company, and sent out his goods marked with labels in which the name Le Page appears, and in a manner similar to the methods used by the Russia Cement Company, and the Court decides as a matter of law that this the defendant has no right whatever to do, and is responsible for all damages which this conduct of his has occasioned the plaintiff.

Instructions and suggestions were then given to guide the jury in determining the amount of damages to be awarded, and from this portion of the charge we make the following extract:

You are not confined, in judging to what extent these goods have been sold to people who have believed them to be the Le Page Glue manufactured by the plaintiff, to the wholesale dealers and the large dealers to whom the defendant may have sold goods. You are entitled to look beyond that. You may judge whether these people are not aware that the retail public are to understand that this is the plaintiff's glue. It may be they are also willing to deceive or it may not, but the question is, how much the sales of the plaintiff are affected which reached the actual consumers of the goods, the manufacturers and the retail trade generally.

We are advised that the case will be appealed by the Le Page Company.

A Great Catalogue.

THE new catalogue of Simmons Hardware Company, St. Louis, is an important addition to the literature of Hardware. Since the publication of the company's 1887 catalogue, the enlargement of their stock and the changes which have taken place in the Hardware business have made it necessary for them to issue this volume. An idea of the size of this work and its scope may be had from the following interesting statistics:

No. of pages, including index	2053 pages
Contains	7750 illustrations
Entire edition	8000 copies
Each copy weighs	17½ pounds
Edition weighs	65 tons
Paper used	4 carloads
Tar board used in binding	9 tons
Skins, Turkey morocco, used	100 dozen
Cloth used in binding	16,000 square yards
Time consumed printing and binding	12 months
Delivered in	500 packing cases
Requiring	80 wagon loads

A picture of their buildings, corner Ninth street and Washington avenue, occuples a place at the beginning of the book. A system of numbering certain lines of goods has been adopted by them to obviate the necessity for writing long descriptions when ordering. The greatest changes have been made in their line of Builders' Hardware, to which they have added three complete lines of Real Bronze Goods of the latest and most artistic patterns, which for the sake of simplicity and clearness they have arranged each in a separate department. At the beginning of these departments are illustrations showing the actual color and appearance of each finish, thus avoiding confusion in finishes, which often occurs in ordering this class of goods. Goods not carried in stock are designated by having the number or sizes printed in red ink. These items, however, are only small portions of 24 pages. No discount sheet is published, but quotations will be furnished upon application for prices. The departments into which the book is divided are as follows:

Tools and Farming Implements, pages 1 to 495.

Miscellaneous Hardware, 496 to 1022.

Cutlery, Shears, &c., 1023 to 1096.

Fire Arms, Sporting Goods, &c., 1097 to 1301.

Tinners' Goods and Trimmings, 1319 to 1430.

Bird Cages, Baby Carriages, Bicycles, &c., 1431 to 1476.

Builders' Hardware, 1477 to 2021.

The index, which has marginal letters, is arranged to facilitate the finding of any line of goods, or any class of a particular line. For instance, Knobs are indexed, and subdivided into Base, Door, Shutter and Thumb. The changes that have occurred on lists since this catalogue was printed occupy two pages, which are placed immediately after the index. A prominent position in Builders' Hardware department is given to Russell & Erwin Mfg. Company's Wrought-Steel Door Locks and Latches, showing many of their new patterns; in fact, new goods are a conspicuous feature throughout the catalogue, while the cuts are exceptionally clear and distinct. The paper is also excellent, the whole make-up of the volume indicating great care and labor. It is probably the largest and most complete catalogue of its kind that has yet been published.

Trade Items.

THE LAUGHLIN NAIL COMPANY of Wheeling, W. Va., have recently made large additions to their Nail factory, and now claim to be the largest manufacturers of Cut Nails in the world. Their claim is substantiated by the fact that they rate their capacity at 700,000 kegs per annum, which is far in excess of the capacity of any other Cut Nail works of which we have any knowledge. In another part of this issue will be found the advertisement of this company, who also manufacture Steel Slabs and Billets. They are represented in Chicago by George G. Spencer, whose office is in the Rookery Building.

HORTON, GILMORE, MCWILLIAMS & Co., 172 to 176 Lake street, Chicago, have issued for the use of their customers a complete copy of the revised Screw list. A copy of the Carriage Bolt list is also given. These lists are arranged with ruled columns, in which the selling price can be marked for the convenience of the salesmen. In a note appended to the lists, the hint is given that a sheet of 10 x 14 tinplate folded over them will be found a convenient method of preservation. A circular letter accompanying the lists refers to the condition of business, and calls attention also to some of their special lines:

We send herewith a copy of the new Screw list, as adopted by the manufacturers, taking effect January 1, 1891, and take this opportunity of thanking our friends for their hearty indorsement of our efforts to extend our trade throughout the West. Business is very heavy, and a greatly increased trade is expected during the coming year. The superiority of our goods and the unvarying, careful attention which we give to mail orders have gained the confidence of the entire trade and increased this branch of our business enormously. To this class of orders we always give our best efforts and lowest prices. Our Cutlery department takes first rank among the trade, and contains all the best goods as well as novelties and specialties which are constantly placed on the market. The brands "Union Cutlery Company" and "Mascotte" are now synonyms for the finest quality and workmanship that can be obtained. The new line of Bicycles purchased by us for the coming season is absolutely without a rival in Europe or America, and we shall very shortly issue one of the handsomest and most complete Bicycle catalogues ever published. We shall be pleased to mail you our new catalogue of Baby Carriages, and are now beyond competition in styles and prices. A spring catalogue of Agricultural Tools, Lawn Mowers, Window Screens, Wire Cloth, &c., has been mailed, and if you have not received a copy kindly let us know.

DAVIS & WATSON, Pittsburgh, Pa., are about to erect a handsome four-story building, 40 x 100 feet, for Light and Heavy Shelf and Mechanics' Hardware and House-Furnishing Goods. Work on the new building will be commenced about April 1, and the firm contemplate moving into their new quarters about the 15th of next October. The site on which the building will be erected is corner of Main and Butler streets. The front of the structure will be granite and fancy brick, and it is expected that the building will be the finest in that section of Pittsburgh. The business will be managed by W. L. Davis, the senior member of the firm, and Charles A. Weber.

J. J. COMSTOCK, formerly manager of the Comstock & Wing Nickel Works, Chicago, and T. H. Cranston, formerly a traveler for the same concern, have organized a company to represent manufacturers of goods similar to those made by the above establishment. The title of the new firm is Comstok, Cranston & Co. They have opened an office in the Fairbanks Building, Randolph street and Wabash avenue, Chicago.

THE AMERICAN FIBRE EXTRACTING COMPANY of Chicago claim to possess a machine which will revolutionize the manufacture of Cordage by greatly cheapening the cost of producing the raw material. It is intended to operate on fibrous plants, such as the magney, ramie, sisal and pineapple. The machine is reported to have been thoroughly tested, and is capable of turning out 1000 pounds of fiber daily, ready to be manufactured into cordage. The inventor is John J. Weicher. The officers of the company are as follows: A. Montgomery Ward, president; Simon Florsheim, vice-president and treasurer; Thomas S. Cruttenden, secretary. They propose to manufacture machines, and rent them to companies formed for the purpose of manipulating fibers.

AT THE WORKS of Henry Disston & Sons, Philadelphia, orders average pretty well up to that of the busy times of last year. Samuel Disston informs us that while business in some sections is slow and unsatisfactory, the improvement in others, particularly on the Pacific Coast and from

some foreign countries, more than brings up the average. The demand for large Circulars is falling off, owing to the decrease in large lumber, but even this is in some degree offset by foreign business, East Indian orders for 72 inch Saws having been received during the past few days.

FAYETTE C. PLUMB reports a similar condition of affairs in Edge Tools, but notwithstanding his very large facilities for manufacturing, finds the demand large enough to keep things moving pretty well up to the full capacity of his works.

G. & H. BARNETT of the Black Diamond File Works expect to have their new catalogue completed and ready for the trade some time during the current month. It has been nearly three years in course of preparation, but they are of the opinion that the production of such a work as this will be is well worth the delay.

THE GLENMORE IRON FOUNDRY of Philadelphia wish to notify engineers and machinery dealers that they allow a liberal discount on their Patent Shaking Grate. Their advertisement will be found on another page.

THE HARTMAN MFG. COMPANY and Union Drawn Steel Company, Beaver Falls, Pa., have appointed A. T. Brook their selling agent, with offices at 102 Chamber street, New York. W. H. Anderson having resigned the position of secretary and treasurer of the Union Drawn Steel Company, T. D. Ganse has been made secretary and manager and C. R. Wylie treasurer. Mr. Ganse retains the position of general sales agent and manager of the Hartman Mfg. Company, who are manufacturing the well-known Hartman Patent Picket Fence, Hartman Flexible Wire Mats, &c. The Union Drawn Steel Company are manufacturing Cold Die-Rolled Steel Shafting, Piston Rods and shapes of various kinds by their improved methods, which they refer to as giving absolute accuracy of product.

THE FIRM of Erdman & Neumeyer, Macungie, Pa., have been dissolved by mutual consent. H. F. Neumeyer, who has been identified with the house for a number of years, will continue the business.

MANUFACTURERS WILL OBSERVE among the Special Notices one from O. N. Stein, Boston, in which he announces his desire to secure additional agencies for New England goods. In a circular referring to his business he alludes to his trade throughout the New England States as representative of manufacturers of Hardware and House Furnishing Goods. References are given to a number of well known manufacturers.

RICHARD H. HOGE is manufacturers' agent for a variety of Iron and Steel products, 18 and 20 Ainsworth Block, Portland, Ore. We are advised that he will operate exclusively with the jobbing trade. Among the manufacturers whom he represents are the following: Salem Wire Nail Company, Peck, Stow & Wilcox Company, American Tube and Iron Company, Mahoning Valley Iron Company, Iron City Tool Works, Howard & Morse, George Griffiths Company, Adams & Westlake Company and the Ellrich Hardware Mfg. Company and others.

THE WOODWARD IRON AND HARDWARE COMPANY, Cairo, Ill., having found their present quarters too small, have decided to erect additional premises. The new building will front on Commercial street and will be 100 x 120 feet in size and three floors in hight. A new feature of their business will be a retail store, occupying a portion of the lower floor of the new building. They will retail everything in the light and heavy Hardware line. They will at the same time increase their wholesale business by adding a complete stock of light Shelf Hardware to their present line. They have had a very satisfactory business during the past year, and they have reason to believe that this addition to their stock will be justified by a largely increased business this year.

CARTER-MAGILL HARDWARE COMPANY, Chattanooga, Tenn., have been sending out a seasonable reminder of the goods their customers will be likely to need in the spring. A suggestive list, including Chains, Plows, Clevises, Steel Goods, Wheelbarrows, Curry Combs, &c., is given.

THE IMPOSING ADVERTISEMENT of Colby Wringer Company, Montpelier, Vt., and 68 Lake street, Chicago, will hardly be overlooked, giving, as it does, a mammoth illustration of their Premium Wringer. It will also be noticed that they request sample orders, whether large or small, and refer to their "Facts Wrung Out and Hung on a Line," to which we have already alluded.

PATTON MFG. COMPANY, Columbus, Ohio, have sold for the year 1891 their product of Ground and Unground Stove Hollow Ware to the Empire Hollow Ware Company of Philadelphia, from whom the goods may be procured by the trade. They, however, continue to offer the other goods of their manufacture, such as Enameled and Tinned Maslin Kettles, Yankee and Scotch Bowls, Saucepans, Glue Pots, &c., and Enameled Triumph Hollow Ware.

IN THEIR ADVERTISEMENT in this issue it will be observed that Henry Disston & Sons, Philadelphia, illustrate a number of specialties of their manufacture, including a variety of Pruning Tools, Plastering Trowels, Miter-Box Saws, No. 9 Improved Back Saw, Samson Post-Hole Digger and patent Adjustable Plumb and Level being also represented.

WOODS, SHERWOOD & CO., Lowell, Mass., on another page illustrate their Sherwood's Reversible Broilers and Toasters, to the advantages of which they allude, and call attention also to other goods in their line.

B. J. SMITH was elected president and re-elected manager of the Hopkins & Dickinson Mfg. Company, Brooklyn, N. Y., at the annual meeting of the directors, held 29th ult. Although Mr. Smith has only had the management of the company's business for a year, we understand that the quality of the goods has been decidedly improved and the line brought into much greater prominence.

C. E. JENNINGS & CO., 97 Chambers street, New York, as manufacturers of Saws, make an announcement in their advertisement which will be of interest, calling attention as it does to some of the leading goods and specialties in this line which they are putting on the market. It will be observed that Pruning Saws, Piercing or Jewelers' Saws are illustrated.

IN THEIR PAGE ADVERTISEMENT in this issue the Steel Edge Stamping and Retinning Company, 89 State street, Boston, illustrate four of their specialties—the Intelligent Oil Can, Improved Dover Egg Beater, Unique Nutmeg Grater and Steel Edge Dust Pan.

THE STATEMENT in last week's *Iron Age* regarding the destruction by fire of the works of Haight & Clark, Albany, N. Y., was misleading and incorrect, the fact being that the plant was only partially destroyed. The main building and some machinery were consumed, but the molding shop and patterns are uninjured. The manufacturers advise us that they are now casting as usual, so that their customers and the trade can be supplied as heretofore.

WE ARE ADVISED that Fuller's Patent Pendulum Level, manufactured by Murray & Porter Level Company, is now on sale by Henry Keidel & Co., Baltimore, Md., and by G. W. Van Tine & Son, 504 Commerce street, Philadelphia, Pa. The demand for these Levels is reported to be increasing, and the manufacturers are pushed to keep abreast of the orders.

THE TRADE will observe on another page the advertisement of the Dover Stamping Company, Boston, Mass., relating to the genuine Dover Egg Beater, manufactured by them. They call attention to the fact that the name Dover Egg Beater appears on the wheel of the genuine goods, and they are now marking their latest pattern beater on the handle with the word "Dover" in a panel. They refer to the fact that other Beaters are not so marked. Late patents, they state, have been obtained, which not only greatly improve the working of the Beater and add to its durability, but make it more perfect than ever.

WILLIAM VOGEL & BROS., Brooklyn, N. Y., are putting on the market a line of Machine Oilers manufactured from drawn steel plate. These goods are made in Chace and Rival patterns. They are also making Sewing Machine Oilers No. 00 and Comet, which are intended for such small machinery as sewing machines, telegraph instruments, typewriters, &c.

THE CINCINNATI CORRUGATING COMPANY of Piqua, Ohio, have removed their Cincinnati offices from the corner of Vine and Fifth streets to 89 and 90 Johnston Building.

IN THEIR ADVERTISEMENT in this issue the Ellrich Hardware Mfg. Company, Plantsville, Conn., announce their arrangements with George S. Knapp of the Knapp & Cowles Mfg. Company, Bridgeport, Conn., to represent them direct from the factory during the present year. They will also be represented by their special agents, Alford & Berkele Company, 77 Chambers street, New York, and other parties named in their announcement.

TOLEDO RUBBER COMPANY, Toledo, Ohio, represent Cleveland Rubber Company in Toledo and adjoining vicinity, carrying a full line of their goods in stock. They are also agents for the Keasey Iron Center Wood Split Pulley. Among other advantages possessed by this Pulley the manufacturers refer to its having narrow spokes against the wind, presenting a surface of 1½ inches, a result of which is that no dust is blown around the shop where Keasey Pulleys are used.

COBURN TROLLEY TRACK MFG. COMPANY, Worcester, Mass., illustrate in their advertisement their patent Store Step Service, showing the arrangement of Movable Ladders for convenient access to shelving. A description is also given explaining the working and advantages of this device.

STEEL EDGE STAMPING AND RETINNING COMPANY of Millis, Mass., have fitted up a portion of their offices in the Fiske Building, State street, Boston, as a show room for samples. In order to avoid having the offices appear like a tinware store, they have constructed a series of cabinets of wood to match the other fittings of the rooms, where behind closed doors a full line of samples repose in attractive array. The visitor unaware of the arrangement may be surprised to find an office apparently innocent of temptation to the buyer suddenly transformed into a salesroom.

THE OMAHA HARDWARE COMPANY, Omaha, Neb., have elected the following officers to serve during the present year: J. N. Cornish, president; E. S. Rowley, vice-president; W. H. Hulshizer, secretary; H. O. Devries, treasurer; E. P. Devries, assistant-treasurer, and T. H.

Taylor, general manager. The company have just completed their second year in business, having been organized January 1, 1889, and report a gratifying trade from the outset, and excellent prospects.

THE MILLER LOCK COMPANY, Philadelphia, in a striking advertisement in another part of this paper, call attention to their Champion 6-Lever Locks, a new patent 4-Lever Automatic Lock, Jail Padlocks and other goods which are deserving the attention of the trade.

JOHN W. STEADMAN of the firm of Keen, Bros. & Steadman, Elkhart, Ind., Hardware merchants, has sold his interest in the firm to Perry Krupp. The firm will hereafter be known as Keen Bros. & Krupp. It is understood that Mr. Steadman will engage in the same line of business at Seattle, Wash.

THE NATIONAL SCREW AND TACK COMPANY, Cleveland, Ohio, call attention in their advertisement to their Carpet Tacks and the manner in which they are put up, giving net prices and quantity discounts in lots of 10, 25 and 50 gross.

NIAGARA STAMPING AND TOOL COMPANY, Buffalo, N. Y., have arranged with F. W. Heitman & Co., Houston, Texas, to act as sales agents for their goods in that city and vicinity. Heitman & Co., will keep on hand a large assortment of these goods, and will be in a position to quote prices on the entire line.

THE TRADE WILL OBSERVE the advertisement of the Russia Cement Company, Gloucester, Mass., in which they refer to the decision in their favor in the trade-mark litigation with the Le Page Company. They also issue a circular giving Judge Nelson's charge to the jury, in which reference is made to principles of law applying to trade-marks and suggestions in regard to the questions determining the amount of damages to be awarded.

AMONG THE SPECIAL NOTICES in this issue Haydock & Bissell, 12 Murray street and 15 Park place, New York, announce a large trade sale of Table and Pocket Cutlery, Carvers, Butcher Knives, &c., on Wednesday, Thursday and Friday, February 11, 12 and 13. It is stated that this sale will include a large line of desirable patterns of Cutlery and Plated Flat Ware, which will be sold in quantities to suit the retail and jobbing trade without reserve.

S. L. ALLEN & Co., 1107 Market street, Philadelphia, in their advertisement on page 98 illustrate some of their well-known line of Planet, Jr., Implements. Their catalogue gives full description of these and other articles of their manufacture.

THE CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio, have moved their New York office from 101 Chambers street to 100 and 102 Reade street, where they will be pleased to meet their customers. They are carrying a large line of Twist Drills and Reamers and are prepared to fill all orders promptly.

THE TRIAL OF an action by the firm of Schoverling, Daly & Gales against Collector Erhardt to recover excessive duties imposed upon an importation of Guns took place before Judge Lacombe, January 29, in the United States Circuit Court. It was a test case. The firm are importers of gun barrels and stocks, which are put together here, but they were held dutiable by the collector as breech-loading sportmen's Guns at 35 per cent ad valorem, and $4 on $6 Guns. The contention of the firm was that their importations were dutiable at 45 per cent. ad valorem on the barrels as manufactures of metal or steel not otherwise classified. Judge Lacombe sustained the views of the importers and reversed the decision of the United States Board of Appraisers.

THE RENSSELAER MFG. COMPANY, Lansingburgh, N. Y., owing to the increase of their Valve business and the consequent necessity of more room for that department, have disposed of their entire Scale business to Jones of Binghamton, Binghamton, N. Y., who will continue the manufacture of these goods and sustain the standard of excellence maintained for so long a period by the former concern. The business will be removed to Binghamton in its entirety, and about 35 men, most of whom reside in Lansingburgh, have been informed that they will be given employment there if they desire it. This disposition of their Scale department will permit the Rensselaer Mfg. Company to give its time and capacity to the manufacture of Valves, and it is proposed to so enlarge and extend the business as to give employment to many more hands than were at work in the Scale division. The company have already, we understand, given orders for a large amount of special machinery.

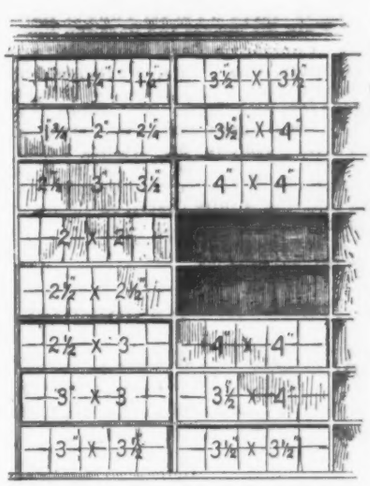
THE LAUGHLIN NAIL COMPANY, Wheeling, W. Va., announce that T. R. Thomas, formerly connected with the Baltimore and Ohio Railroad, has succeeded F. M. Strong as secretary of the company.

THE TRADE will be glad to learn that Horace F. Sise is now engaged in the Hardware commission business at 114 Chambers street, New York, selling goods for factories by sample, but carrying no stock. He has recently been appointed agent for Charles L. Sherman, manufacturer of Double-Pointed Tacks and Wire Staples, Wire Nails, Brads, &c.

Arrangement of Goods on Shelving.

THE FOLLOWING inquiry has been received from a correspondent in St. Louis:

A number of clerks are in a dispute in regard to putting goods on shelves. We should like to have an opinion on the subject.



Arrangement of Goods in Shelves.

The accompanying illustration shows that the disputed point is whether after the first tier of shelving is filled with a class of goods, Wrought Butts in this case, the arrangement for the remaining sizes should be from the top of the next tier down, or from the bottom of the next tier up?

This is an interesting point, as uniformity in shelf arrangement of goods should characterize the entire stock. There may also be some difference of opinion in regard to the question. We submit it to our readers, and shall be glad to hear from them on the subject.

Building Papers and Roofing Felts.

THE HANDLING of Building Papers and Roofing Felts has become so prominent a feature in the Hardware trade, the following list of leading manufacturers and their products may be of interest to our readers:

EHRET-WARREN MFG. COMPANY, St. Louis, Mo.: Offer Plain and Tarred Straw Board, Diamond Brand Rosin-Sized Sheathing, Peerless Brand Sheathing, Excelsior Parchment Sheathing, Neponset Insulating Papers, E. & W. Tarred Felt, &c.

F. W. BIRD & SON, East Walpole, Mass.: Neponset Water Proof Papers, No. 1 Neponset Red Rope Roofing Fabric, Black Neponset Building Paper and Neponset Insulating Paper. It is stated that Neponset Papers are not coated, but are water proof all through.

THE STANDARD PAINT COMPANY, 59 Maiden lane, New York: P. & B. Building Paper, Giant P. & B. Building and Insulating Paper and the Universal Building Paper. The point is made that these Building Papers are coated with the P. & B. compound, containing no tar or oil, rendering them water, acid, alkali and gas proof.

AMERICAN STRAW BOARD COMPANY, Chicago: Plain Board, American Sheathing, Standard Sheathing, Plain and Corrugated Moth Proof Carpet Felt, Deadening Felt, Roofing Felt, Tarred Board, Amazon Water Proof Sheathing, Water Proof Sheathing, Inodorous Board and Tarred Roofing Felt.

NEWTON PAPER COMPANY, Holyoke, Mass.: Corrugated Carpet Lining, No. 1 Gray Rosin-Sized Sheathing and Rosin-Sized Sheathing Paper.

THE NELSON-SPENCER PAPER COMPANY, Minneapolis, Minn.: Plain Board, Tar Felt, Tar Board and Moth Proof Carpet Lining.

S. E. BARRETT MFG. COMPANY, Chicago: Inodorous Board, Plain Straw Board, Peerless Niagara and Diamonds brands of Rosin-Sized Sheathing, Neponset Rope Insulated Paper, No. 2 Neponset Rope Sheathing, Excelsior Building Paper, Cedar Moth Proof Carpet Lining, XX Blue Corrugated Carpet Lining, Eureka Deafening Felt, Noiseless Deafening Felt, Tarred Felt, Tarred Board, Two and Three Ply Felt, Asbestos Sheathing, &c.

THE BIRD PAPER MFG. COMPANY, 149–151 Church street, New York: Bird's Sheathing. It is claimed this is water proof, odorless, vermin proof and air tight. It is intended for sheathing buildings, lining ice houses and refrigerators between floors, or under shingle, slate or metal roofs. It is stated that it will not absorb moisture, that it will not shrink nor swell, and that it is a non-conductor of heat and cold.

H. F. WATSON, Erie, Pa.: Asbestos, Sheathing, Building Felts, Mill Boards, Building, Manilla, Carpet, Asbestos and Pulp Lined Papers; also, Tarred Roofing Felt, Asbestos Roofing, Asbestos Roof Coating, White Asbestos Coating, Asbestos Roof Cement, &c.

Price Lists, Circulars, &c.

HOPPER LUMBER AND MFG. COMPANY, Michigan City, Ind.: Refrigerators and Ice Chests, built upon the Hanrahan patent automatic system of refrigeration. In this catalogue announcement is made that the company have adopted the plan of placing the ice chamber at the side of the provision chamber instead of overhead. They claim that in this manner

more perfect circulation is secured, as well as other advantages, all of which are shown in illustrations making comparisons of both systems. Metal linings have also been discarded for wooden ones, the kind of wood selected being odorless and tasteless. In reducing the hight of their Refrigerators the company have made them useful for other purposes by furnishing them with a solid hardwood table top for such sizes as are in general household use. The Automatic do not have the table-top feature, and are intended for large families, hotels, grocers, &c. No metal is used in the interior of these Refrigerators except a drip pan under the ice chamber, even the provision shelves being made of hardwood strips, the object being the avoidance of condensation of moisture which is attributed to metal linings.

J. H. SNELLING, 158 South street, New York: Yacht, Ship and Steamboat Fixtures, Patent Steering Apparatus, Windlasses, Mast Saddles, Capstans, Winches, Pumps, Iron and Brass Castings, Galvanized and Electro-Plated Goods, Bells, Dead Lights, Stanchions, Deck Lights, Hand Rails, Ventilators, &c.; Adair's Double-Action Ship Pumps, Deluge Brass-Lined Pumps, Diaphragm Pumps, &c. Repairs furnished for vessel Pumps and Machinery.

H. F. BRAMMER MFG. COMPANY, Davenport, Iowa: The Wright Self-Adjusting Step Ladder, Washing Machines, Churns, Ironing Boards, Clothes Racks, Bee Hives, Boxes, Shipping Cases and Sweet's Dry Air Refrigerators

ALASKA REFRIGERATOR COMPANY, Michigan City, Ind.: Household Refrigerators, Ice Chests, Grocery and Hotel Refrigerators, Butchers' Refrigerators, Beer Coolers, Cooling Rooms, &c. The special features of these Refrigerators are the use of well-dried match wood for the inside body or frame, giving durability; all exposed wood inside is odorless tulip poplar; the space between the outer and inner walls is filled with pure charcoal; the feet are so made that they cannot be torn loose nor spread open; the casters are of original design, made of malleable iron; the syphon cup is a patent device fitted to the waste pipe in the provision chamber and not outside of the Refrigerator; the provision shelf is made of solid metal with corrugated slats; the trimmings are expressly made for these goods. Cuts are given to show the construction of these Refrigerators and the manner in which air circulates. Two lines of Household Refrigerators are made, the one being finished in imitation and the other being hardwood. The variety of patterns shown in the catalogue is unusually large, embracing all kinds from the severely plain to elaborately carved. There are 64 pages in all.

IMPERVIOUS PACKAGE COMPANY, 86 Park place, New York: Impervious Safety Oil Cans for family use, New Era Oil Cans for family use and Family Sugar Buckets, insect proof. It is stated that the Impervious Safety Oil Cans are made from wood, with the inner surface so prepared as to be perfectly impervious to kerosene or other oils; that they are fitted with nickel plated Compression Faucets and Vented Fillers, and that they are free from leak, sweat or odor.

BISSELL CHILLED PLOW WORKS, South Bend, Ind.: Right and Left-Hand Plows, Chilled and Combination Plows, Steel-Beam Plows, Reversible Point and Share Plows, Hillside Swivel Plows, Cast Plows, &c.

BELDING MFG. COMPANY, Belding, Mich.: New and very handsome catalogue of Belding's New Perfection Refrigerators. Letterpress printed in blue, with illustrations in light brown. The illustrations shown comprise a full line of Refrigerators for family and hotel use, with special constructions for butchers and grocers The family Refrigerators cover Chests, Uprights and Sideboards. All are elegantly finished in antique oak, but the Sideboard designs are very handsome. The improvements enumerated for 1891 are as follows: The use of improved charcoal sheathing for lining, by which the advantages of charcoal filling are secured, while all danger of its packing and settling is obviated; a solid galvanized corrugated Ice Rack, strongly made and substantially riveted; no corners to open and the front base made so as to raise, giving easy access to the drip pan beneath; doors have genuine bronze surface hinges; a new patent lever lock has been devised which automatically closes the doors perfectly tight; lid hinges are solid bronze; the tank refrigerators are supplied with a patent faucet. The catalogue contains a detailed description of the manner in which these Refrigerators are made and illustrations of the method by which air circulation is secured. The company now have six branch offices—223 Fifth avenue, Chicago; 299 Pearl street, New York; 52 Pearl street, Boston; 249 North Second street, Philadelphia; 610 North Fourth street, St. Louis; 181 West Fifth street, Cincinnati.

L. DERMIGNY & CO., 126 West Twenty-fifth street, New York: Family Ice Machines and Domestic Ice and Water Cooling Machines. It is stated that by operating these machines a few minutes iced water or liquids may be obtained, artificial ice frozen or ice cream frozen. They recommend these machines for the use of families, doctors, sportsmen, sailors and persons living in tropical climates. Reference is made by the manufacturers to the fact that all refrigerants can be used, but their special salt is recommended, which is alluded to as harmless, and by reconstitution can be used indefinitely.

G. T. MOORE, 112 Chambers street, New York: Hardware Specialties and Tools. In a price-list and catalogue recently issued are described and illustrated a line of these goods, of which G. T. Moore is manufacturer or for which he is manufacturer's agent. It relates to Phœnix Vises, Phœnix Pipe Vises, Phœnix Barrel Truck, Lathe Dogs, Pipe Tools, Hatchets, Hammers, Wrenches, Molasses Gates, Pliers, Plumbs and Levels, Lawn Mowers, &c. Particular attention is directed to Mason & Parker's line of Ratchet and Plain Bit Braces and Paragon Novelty Mfg. Company's Cast Hammers, Speed Indicators, Gas Pliers, Wrenches and a large line of other tools, he being sole agent for both firms. Mr. Moore is also New York agent for the Trimo Pipe Wrench. Among the articles which he is manufacturing is the Eagle Washer Cutter, which has recently been added to his line. It is fully described in the catalogue, which shows its special features and advantages. All the above goods are carried in stock.

Trade in Washington.

WE ARE IN RECEIPT of advices from J. W. Dodge, secretary of the Seattle Chamber of Commerce, Seattle, Wash., with reference to business in that city and throughout the Puget Sound district. Our correspondent desires to correct the impression given in a communication which appeared in our columns to the effect that owing to dullness of trade the line of steamers plying between San Francisco and Puget Sound ports is to be withdrawn. Instead of this, it is stated that business at Seattle during the past year was not only good, but largely in excess of 1889. Our correspondent then adds:

The receipts and shipments of freight by the several transportation lines will illustrate this fact. For instance, the freight business of the Northern Pacific at Seattle for the months of November and December, 1890, exceeded that for the same months of 1889 by 41.6 per cent. The Union Pacific shows an increase of over 30 per cent. for the year 1890, as compared with 1889; the Pacific Coast Steamship Company, 30 per cent., and the Canadian Pacific, 33⅓ per cent. As to the withdrawal of any steamship line, or even a single vessel now plying between San Francisco and this point, there is not up to this time the slightest foundation. On the contrary, two lines are contemplating putting on additional boats. The Hardware trade of this city has been materially extended during the year, and in the aggregate has increased over 30 per cent. Collections, while slow during the past two months, have for the year been good, and no losses are reported. Trade is more than usually good for this season of the year, and the outlook is certainly favorable.

It is Reported—

That Evans & Co. is the title of a new Hardware store at Princeton, Minn.

That William H. Hotchkiss has embarked in the Hardware business at Highland Falls, N. Y.

That Edward L. Clark has sold out his Hardware business at Ashland, Maine, to Jarvis Hayward and Jerome Finson.

That C. H. Dunbar, Fairport, N. Y., has sold his stock of Hardware, Stoves and Agricultural Implements to Fred. Schummers, of that place. Mr. Dunbar intends to remove to Marion, Ind., and engage in business there.

That the large Hardware establishment of H. V. Hudson, Luray, Va., was considerably damaged by a recent fire.

That Ewing & Gaines, wholesale Hardware dealers, Nashville, Tenn., are closing out their business.

That J. E. Kirkland, Independence, goes to Newport, Ore., to engage in the Hardware business with W. E. Cooper.

That Crocker & Greenwood, Hardware, Marlborough, Mass., have dissolved. Mr. Greenwood has purchased the business and will continue it alone.

That G. A. Bartlett has offered to purchase G. E. Partridge's interest in the Hardware firm of Partridge & Blake, Holliston, Mass.

That William F Peebles' Hardware store at Summersville, N. J., was slightly damaged by fire recently.

That Beun & Sweeny, Huntsville, Ohio, have removed their Hardware store to Jackson Center, Ohio.

That Selfridge & Scott will be the proprietors of a new Hardware store at Spokane Falls, Wash.

That the Hardware store of Chittenden & Dunn at Hunt's, N. Y., has been purchased by Avery & Thompson, Nunda, N. Y. and Edward Hinkley.

That Porter, Clark & Co., Hardware dealers, Central City, Iowa, have dissolved partnership. H. G. Porter has bought the interest and will continue the business.

That G. W. Toms & Co., Central City, Iowa, have sold their Hardware store to James Slife and N. C. Gillilan.

That Samuel Clemens will open a Hardware store at Cuba, Ill.

That the Mosher Hardware stock at Grand Island, Neb., has been bought by S. D. Kelley.

That a new Hardware store has been opened in Waterman, Ill., by E. P. Orr and E. N. Whitney.

That Shaffer & Weaver have opened a new Hardware store in Dayton, Ohio.

That Barkley & Wheat, Hardware, &c., Fort Collins, Col., have dissolved part-

nership. The business will hereafter be conducted by E. R. Barkley, who has purchased J. K. Wheat's interest.

That C. W. Fishel, of Carbondale, will establish himself in the Hardware business at Aspen, Col.

That Frank Jackson, Grainfield, Kan., has assumed charge of A. J. Ayres' Hardware store at Nevada, Mo.

That G. M. Howard's Hardware store at Algona, Iowa, was destroyed by fire on the 27th ult.

That F. Howe & Co., Hardware, West Valley, N. Y., have sold out their business to J. Feidt.

That the firm of G. R. Spannagel & Son, Nokomis, Ill., has been dissolved, G. R. Spannagel retiring. His son, G. H. Spannagel, will continue the business as heretofore.

That William H. Bailey, Raymond, N. H., has disposed of his business to Shattuck & Sons.

That Foote & Church, Charlotte, Mich., have sold their Hardware store.

Exports.

PER SHIP PILGRIM, JANUARY 14, 1891, FOR SYDNEY N. S. W.

By Joseph Dixon Crucible Company.—88 pounds Lead Pencils.

By Meriden Britannia Company.—2 boxes Plated Ware.

By Graphite Pencil Company.—40 gross Lead Pencils.

By Collins & Co.—376 dozen Edge Tools.

By Edward Miller & Co.—72 packages Lamp goods.

By W. K. Freeman.—321 pounds Hardware, 20 dozen Axes, 12 dozen Picks, 1 case Drills, 38 pounds Hardware, 15 dozen Handled Axes, 21 dozen Hardware.

By Arkell & Douglas.—1 dozen Lamp Goods, 70 dozen Axes, ½ dozen Bolt Clippers, 1½ dozen Pumps, 8 dozen Hammers, 4 cases Hardware, 118 dozen Axes, 6 dozen Forks, 50 dozen Hammers, 9 dozen Saws, 2 Scales, 9 sets Axles, 1 Ice Machine, 11,237 pounds Barb Wire, 40 dozen Axes, 8 dozen Picks, 6 dozen Braces, 6 dozen Saws, 300 pounds Staples, 6 dozen Scoops, 8 gross Blocks, 40 dozen Axes, 2 Shellers, 12 dozen Braces, 60 Stoves, 6 dozen Ladders, 30 dozen Lamps, 3 dozen Shears, 9 dozen Hammers, 40 dozen Axes, 6 dozen Bush Hooks, 1½ dozen Pumps, 12 Scales, 5 dozen sets Sad Irons, 2 dozen Wringers, 1 gross Polish, 15 sets Axles, 8 gross Metal Polish, 9 dozen Wrenches, 6 dozen Hoes, 15 dozen Hammers, 48 cases Pick Handles, 538 pounds Road Carts, 4398 pounds Axles, 2070 pounds Plows, 9 cases Axles, 15 dozen Axe Handles, 460 pounds Plows, 410 pounds, Axles.

By H. W. Peabody & Co.—2 boxes Nails, 2 cases Tacks, 3 cases Hardware, 2 boxes Nails, 5 packages and 2 cases Hardware, 10 dozen Anti-Rattlers, 2 gross Egg Beaters, 2½ gross Lemon Squeezers, 15 pairs Shears, 1 dozen Corn Mills, 2 cases Plow Parts, 9 cases Carriage Hardware, 650 pounds Tacks, 6 dozen Traps, 1 dozen Scales, 675 pounds Iron Bolts, 2 gross Egg Beaters, 1 case Hardware.

By Combs, Crosby & Eddy.—2 dozen Saws, ½ dozen Lanterns, 2½ dozen Lampware, 6 Churns, 12 dozen Axes, 6 dozen Cow Bells, 6 dozen Wrenches, 42 Churns, 13 dozen Bird Cages, 6 dozen Wringers, 2 dozen Scales, 4½ dozen Ladders, 23½ gross House-Furnishing Goods, 30 dozen Sad Irons, 1 package Axes, ½ dozen Sad Irons.

By W. E. Peck.—3 packages Plated Ware.

By V. Basanta.—24 dozen Hoes.

By R. W. Forbes & Son.—2 packages and 20 pounds Carriage Hardware.

By S. Hoffnung & Co.—15 dozen Tinware, 14 Wringers, 1 dozen Sweepers, 24 Stoves, 2 gross Pistols, 25 gross Tools, 3 dozen Traps, 70 gross Bolts, 4½ gross Wire Goods, 17 dozen Braces, 40 boxes Tacks, 504 pounds Nails, 9 Scales, 40 dozen Bells, 3 cases Hardware.

PER BARK SAMAR, JANUARY 15, 1891, FOR SYDNEY, N. S. W.

By Coombs, Crosby & Eddy.—6 dozen Tools, 2⅜ dozen Saws, 294 dozen Hardware, 2 Boring Machines, 4½ dozen Saws, 6 Lawn Mowers, 14 Stoves, 44 pieces Plated Ware, 233 pounds Nails, 624 pounds Rivets, 2 dozen Choppers, 38 pounds Washita Stone, 72 pounds Hardware, 9 dozen Cow Bells, 21 gross Hardware, 1 dozen Ladders.

By Kelly Axe Mfg. Company.—750 pounds Axes.

By W. & B. Douglas.—59 Pumps.

By A. S. Lascelles & Co.—14 cases Hardware, 15 dozen Hoes, 100,000 Primers, 33 dozen Axes, 8000 Cartridges, 6 dozen Mattocks, 1 gross Picks, 252 pounds Nails, 20 dozen Axes, 1 case Cages, 2 dozen Churns, 3 packages Cow Bells, 2 dozen Meat Cutters, 27 dozen Axes, 3 dozen Ladders, 1½ dozen Cutlery, 112 pounds Whetstones, 2 dozen Wrenches, 12 cases Lanterns, 1 gross Rakes, 2½ gross Thermometers, 6 cases Agricultural Implements, 2 packages Ladders.

By Simpson, Hall, Miller & Co.—10 packages Britannia Ware.

By Strong & Troubridge.—1 dozen Lampware, 10 Stoves, 28,000 Bolts, 3 dozen Hoes, 1 Pump, 515 pounds Nails, 14 Emery Wheels, 2 Chucks, 9 dozen Wrenches, 6 dozen Whip Sockets, 1 dozen Locks, ½ dozen Drills, 3 dozen Braces, 9 gross Sash Lifts, 6 packages Emery Wheels.

By E. W. Harrison.—1 case Twist Drills, 5 packages Hardware.

By R. H. Dana & Co.—38 packages Hardware, 25 cases Axes, 3 cases Plows, 3 cases Hardware, 1 case Hammers.

By F. B. Wheeler Company.—1 case Hardware, 30 dozen Brushes, 3 cases Hardware, 20 dozen Axes, 25 dozen Hardware.

By Simpson, Hall, Miller & Co.—2 casks Britannia Ware.

By J. L. Mott Iron Works.—10 Stoves.

By W. H. Crossman & Bro.—20 dozen Axes, 12 dozen Hammers, 3 dozen Wrenches, 1 dozen Wringers, 6 dozen Stones, 2 dozen Wrenches, 2 Scales, 7 cases Hard Ware, 5 dozen Clamps, 2 packages Platedware, 2 boxes Carpenters' Tools, 3 dozen Traps, 6 packages and 5 cases Hardware, 4 dozen Wringers, 27 dozen Hammers, 12 Stoves, 3 dozen Tills, 2 Hand Trucks, 12 dozen Lanterns, 30 dozen Axes, 94 sets Axles, 2 dozen Corn Mills, 1 dozen Scrapers, 3 dozen Carpet Sweepers, 54 dozen Hammers, 1½ dozen Corn Shellers, 1500 feet Hose, 27 dozen Cow Bells, 4 dozen Bits, 37 packages Hardware, 1 crate Pump parts, 20 gross Polish, 2 gross Traps, 36 sets Axles, 2 dozen Lanterns.

By R. W. Cameron & Co.—1 case Hardware, 6 dozen Lamp Goods, 6 dozen Lamp Goods, 2 boxes Wood-Working Machinery.

By A. Field & Sons.—22 boxes Iron Nails.

By R. W. Forbes & Son.—41 packages Agricultural Machinery.

By Healy & Earl.—1 box Blacksmiths' Drills, 2 boxes Hardware, 1 box Emery Wheels, 3 cases Forges, 12 boxes Wood-Working Machinery.

By Ilsley, Daubleday & Co.—3 gross Hardware, 6 dozen Lemon Squeezers, 12 dozen Brushes, 6 Air Guns, 7017 feet Leather Belting, 2 Road Carts, 24 gross Hardware.

By H. W. Peabody & Co.—1 case Hardware, 6 dozen Edge Tools, 2 cases Lawn Mowers, 1 case Tools, 2 packages and 1 case Hardware, 6 packages Corn Shellers, 6 dozen Churns, 40 packages Stoves, 3 packages Hardware, 1 case Rivets.

By Carhart & Blanchard.—28 cases Lawn Mowers.

By McLean Bros. & Rigg.—24 pounds Malleable Iron, 112 pounds Whetstones, 1 dozen Wringers, 3 Refrigerators, 8 dozen Razors, 2½ dozen Hair Clippers, 6 dozen Hammers, 86 dozen Brushes, 23 dozen Thermometers, 22 dozen Drills, 1 Vise, 48 dozen Springs, 1 case Granite Ware, 1 dozen Lawn Mowers, 6 dozen Transom Lifters, 12 dozen Braces, 3 dozen Planes, 500 pounds Nails, 17 dozen Hammers, 26 Wrenches, 4 dozen Meat Choppers, 50 dozen Wire Goods, 30 dozen Axes, 24,000 Shot Cartridges, 50,000 Primers, 54,000 Metallic Cartridges, 1 dozen Miter Boxes, 36 dozen Axes, 72 dozen Hinges, 72 dozen Stepladders, 6 dozen Bush Hooks, 12 dozen Curry Combs, 33 Store Trucks, 52 dozen Saws.

PER BRIG LEONORA, JANUARY 16, 1891, FOR PORT ELIZABETH, SOUTH AFRICA.

By the Goulds Mfg. Company.—3565 pounds Pumps.

By John Norton's Son.—6 Road Scrapers, 6 Corn Mills, 6 Carts, 4 cases Pumps, 1 Rifle, 5000 Cartridges.

By Coombs, Crosby & Eddy.—30 dozen Edge Tools, 296 pounds Scales, 80 Agricultural Implements, 16 Store Trucks, 2 Hand Carts, 6 Blocks, 4 cases Choppers, 9 Stepladders, 9 cases Hardware.

By W. H. Crossman & Bro.—2 Scales, 2 cases Hardware, 1 Harrow, 3 dozen Churns, 102 cases Agricultural Implements, 90 cases Hardware, 40 Scales, 16 cases and 5 crates Hardware, ½ dozen Axles, ½ dozen Scales, 1 cask Pumps, 7 packages Hardware, 900 feet Rubber Hose, ½ dozen Shellers, 6 dozen Rakes, 9 Grindstones, 187 packages Agricultural Implements, 5 racks Churns, 20,000 pounds Barb Wire, 16 packages Ladders, 2 cases Axles, 1500 pounds Nails, 4 gross Stove Polish, 3319 pounds Manila Rope, 3 Washing Machines, 11 Scales, 29 crates Stoves, 4½ dozen Hardware, 1 case Hardware, 1 dozen Wheelbarrows, 42 cases Hardware.

Paints and Oils.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Few changes have taken place in either branch of trade the past week, and, apart from the agreement formed by the crushers to maintain uniform prices for Linseed Oil, nothing has transpired that would tend to affect the situation The position of crude materials seems to be well defined and affords no cause for apprehension as to prices for the leading Paints and Oils in the immediate future. In point of fact, the indications are that supply and demand is the one particular regulator of values at the present time. Just now the demand is rather slow all along the line, but there is no pressure on any of the more staple goods for sale, and the opinion is general that supplies are well under control.

White Lead, &c.—Corroders report some improvement in sales of their product, but the market is not lively, by any means. For that matter, the distribution seems to be hardly up to the average for the season. At first hands the January list is rigidly adhered to, but jobbers adjust their prices to suit circumstances, and frequently give good customer s a cut on the official quotation for lots of 1000 pounds. Inferior Leads have also been rather slow of sale, but are without change in price. Several manufacturers report a better movement of Ready-Mixed Paints.

Zincs.—The old line of prices is adhered to by manufacturers of American Oxide, and, besides a steady movement in the form of deliveries on back orders, there has been a very fair amount of new business. Foreign brands are without change and in rather light demand.

Colors.—In this line there are no important changes to note. The Paris-Green manufacturers have failed to agree upon a satisfactory plan for the coming season, and prices for the "insecticide" are still unsettled, For House-Painters' Colors generally and most varieties of Grinders' Colors there is a fairly good, seasonable demand, and prices are holding steady nearly all through. A revision of list prices on Quicksilver Vermilion has been made by American manufacturers, who now quote 67¢ for bulk, 68¢ for bags and 72¢ for small quantities.

Oils and Turpentine.

Linseed Oil.—In accordance with the provisions of the agreement entered into at the meeting of crushers last week, the price for other than city brands in this market is 54¢ minimum. This rate appears to be firmly adhered to thus far, and there are some indications of a stronger combination being effected in the future. City crushers have made no change in their prices, but since the narrowing down of the margin of difference between Western and city product, the latter has found freer sale. The quotations are 56¢ for domestic and 62¢ for Calcutta Seed product.

Cotton-Seed Oils.—There has been no change in this line the past week. The higher range of prices for prime quality stock that was established some little time ago appears to be maintained, but the demand is not as high, and the enhanced cost is partly responsible for the slowness of orders.

Lard Oil.—The movement of prices has been within very narrow bounds, and the market is wholly bare of new feature. Current sales are of strictly routine character, and the demand is merely fair.

Columbia Light Roadster Safety.

Pope Mfg. Company, Boston, are putting on the market an 1891 pattern Columbia Light Roadster Safety Bicycle, as illustrated, Fig. 1. The manufacturers state that in preparing it they have given careful study to the considerations of strength, comfort, weight, appearance and general effectiveness for its purpose. Attention is directed to the new double diamond frame, the spring joints, ball-bearing socket steering head, wheel construction, one-piece hollow handle bar, new tubular saddle rod and bridge, their Elliott self-oiling chain, detachable gear wheels and adjustable foot rests. The double-diamond frame is referred to as being very rigid, graceful and materially lighter than before. It will be noticed that the handle bar is curved backward to bring the handles to a desirable and natural position for the rider. The hubs have been improved, and the spokes are double-butt ended. The driving gear, Fig. 2, is referred to as entirely new. The cones of the crank-shaft bearing are made with flanges having deep-milled edges, permitting very ready adjustment, and easily locked by a new check. The point is made that all steel forgings are used, not a casting being found in the whole machine.

Fig. 1.—Columbia Light Roadster Safety.

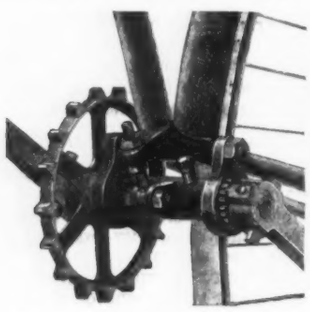


Fig. 2.—Columbia Driving Gear.

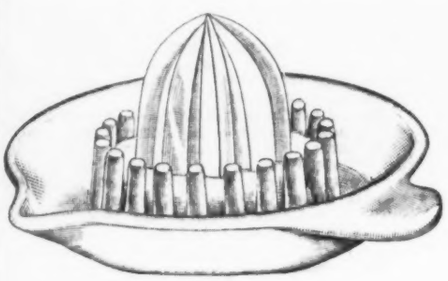
Home Rule Family Can.

The Winfield Mfg. Company, Warren, Ohio, are introducing an oil and gasoline can, as illustrated herewith. The cans are made in 3, 5 and 10 gallon sizes, of plain tin, tin with wood jacket, and galvanized iron with tin top and cover. The label is neat in design and attractive in appearance, being printed in colors on a red ground. The filling tube is so arranged that large lamps may be filled when in the position shown in the cut, and by turning the tube to the outside higher lamps may be filled. All drippings from the filling tube are returned to the can through an opening in the top, and when not in use the filling tube closes this opening air tight. The pump rod passes through a screw can top, which is large enough to admit of the pump plunger being removed when the top is unscrewed. The screw can top, which is removed for filling the can, is attached to a crescent-shaped piece of tin within the can by a chain, which obviates the possibility of its being lost. The working parts of the can are covered by a hinged top. The manufacturers claim that the can may be carried in the rain without admitting water, that it is dirt and evaporation tight, that the pump throws a steady stream, and that it does away with the objection to lifting and pouring from a large can in filling lamps. Every can is guaranteed perfect.

Home Rule Family Can.

Manny Lemon-Juice Extractor.

Manny Lemon-Juice Extractor Company, Rockford, Ill., are introducing a saucer lemon squeezer, as illustrated herewith. This is made of clear glass, consisting of a saucer, from the center of which rises a ribbed cone surrounded at its base with a row of projections. It is claimed that it is made of glass so heavy that it is well-nigh indestructible. It retains the juice in the saucer, thus obviating the use and liability of breaking glass tumblers. It is stated that the black scales on the outside of many lemons are the covers under which dwell certain insects. The advantage of this juice extractor is that it operates upon the pulp within the lemon and does not crush insects with the lemon, as in ordinary lemon squeezers.

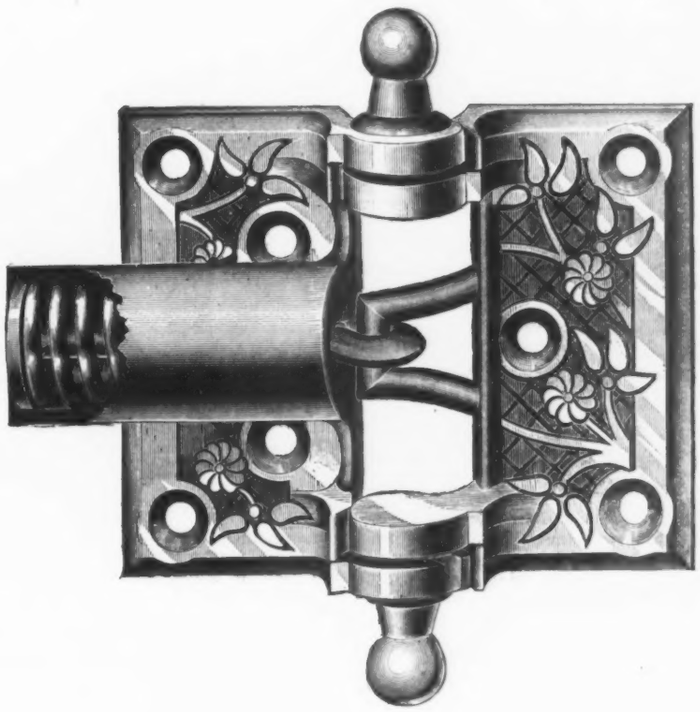


Manny Lemon-Juice Extractor.

There are about 40 sardine factories in Maine, which will turn out this year 500,000 cases, or 50,000,000 cans.

No. 10 Matchless Spring Hinge.

E. C. Stearns & Co., Syracuse, N. Y., are putting on the market for the season of 1891 a spring hinge, as illustrated herewith, which is an improvement on their No. 10 hinge of last year. The improvement consists in changes made in the construction of the hinge. The cylinder containing the spring is now cast with and

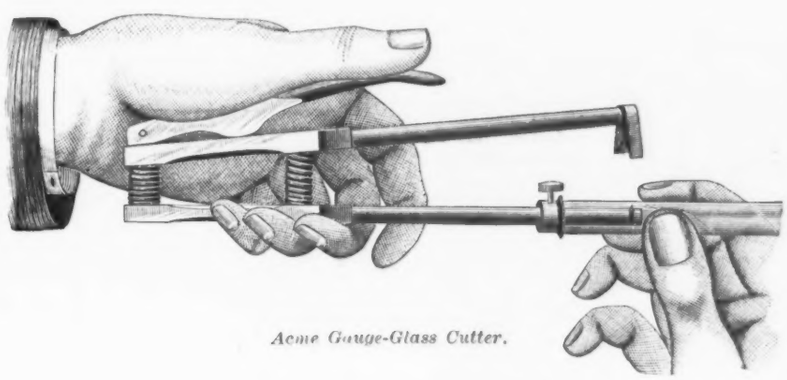


No. 10 Matchless Spring Hinge.

is a part of one of the leaves, while the lug to which the end of the spring is secured is fastened to the opposite leaf in a different position than formerly. The tension is obtained by compressing a spiral spring. The point is made that in this form the entire length of spiral is utilized in resisting the strain, and the concentration of strain at any one point of the spring is avoided. The cut is broken away, showing the position and action of the spring, which is of tempered crucible steel wire. The points of excellency claimed for the hinges are: That the spring cannot be affected by the weather, as it is inclosed in a cylinder; that it has a stiff spring and holds the door strongest at the closing point; that it is made extra strong, with no light parts to break or get out of order; that it may be used on either right or left hand doors, and that it is handsome in design.

Acme Gauge-Glass Cutter.

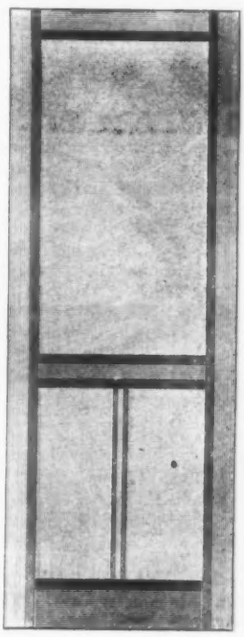
Hine & Robertson, 45 Cortlandt street, New York, are introducing a gauge-glass cutter, as illustrated herewith. The lower arm has a scale in inches and a fraction of an inch, with a rotary cutter at the end. The slide top, with set screw, is set to the required length that the gauge glass is to be cut. The upper arm holds the glass in place and exerts the required pressure while the glass is being rotated. The arrangement of the springs and lever is such that when the lever is pressed down the upper and lower arms are parallel. After the cut has been made upon the inside of the glass, very little pressure is required to break it off. Two sizes are made, one with the scale up to 5½ inches and the other up to 7½ inches.



Acme Gauge-Glass Cutter.

Flush Pattern Screen Door.

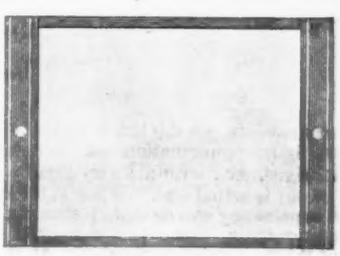
A. J. Phillips & Co., Fenton, Mich., are putting on the market a flush pattern screen door, as illustrated herewith. This door is put together with dowels. The dowels are hard maple, threaded, thereby holding the glue very firmly. The width of the pieces forming the door gives great strength, so that the manufacturers do not hesitate to guarantee their ⅞ doors to be equal in strength to other doors with a mortised joint, from stock 1⅛ inches thick, where the pieces are narrow. In this door the molding which covers the wire cloth is continued the whole length of the door and is let into the face, so that it is flush with the surface, the door itself being beaded on the opposite side to correspond with this molding; it thus appears exactly the same on both sides. The doors are made from white pine, unless basswood is ordered, the latter being lower in price.



Flush Pattern Screen Door.

The Leader Window Screen.

Queen Anne Screen Company, Burlington, Vt., are putting on the market a window screen, as illustrated herewith. This is an adjustable spring screen, the springs being concealed in the bottom and top pieces of the frame. The adjustable end pieces are held in place by hooks of No. 10 coppered iron wire, which are connected with the actuating springs. The frame is cherry stained, the end pieces having brass cups for convenience in applying or removing the screen. These screens are made in four sizes, from 21¼ to 23¼ inches high and from 25 to 33 inches wide when closed, each size having an adjustment of 4 inches.

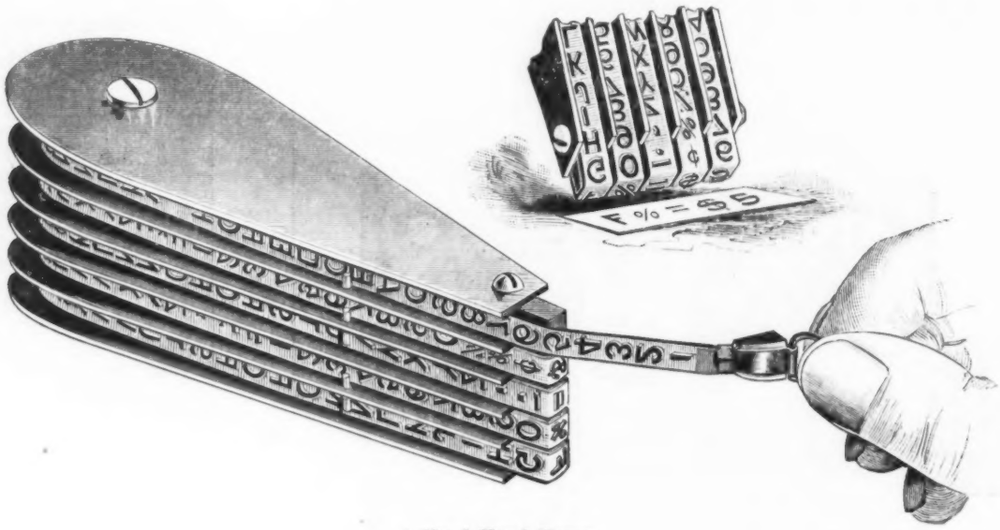


The Leader Window Screen.

The Virginia Mining and Investment Company, with $100,000 capital stock, have been incorporated at Staunton, Va., to operate iron mines. N. W. Moore is president; N. W. Hibbert, vice-president; and W. E. Craig, secretary.

A Novel Hand Stamp.

The Appleton Mfg. Company, Thirtieth and Thompson streets, Philadelphia, Pa., are making and putting on the market a strikingly new and simple changeable hand stamp, an illustration of which is here shown. It consists of a nickel case, having divisons, each for a rubber type strip, one end of which is wound around a spring drum, in the same manner as the common spring tape measure, and will thus accommodate all the letters in the alphabet, figures, punctuation marks, commercial signs, &c., within a very small space. The cut is actual size. When it is desired to express any one or more letters, figures, fractions, &c., it is only necessary to draw out the type strips successively, as shown in the illustration, and press the friction clutch seen near the thumb and forefinger between the partitions on the opposite side; this holds the type securely in place and makes alignment perfect. Changes can be made almost instantly. There are hand stamps and hand stamps; only a small number that are changeable, and but few that undertake to do more than date or number. But here we have one that has a wide field of usefulness. Besides the countless office and factory uses it proves a great labor-saving device to merchants in marking cost and selling prices either on tags or on goods, display cards, &c.; also in marking discounts on circulars. These stamps are made to accommodate different numbers of type strips and for various sizes and styles of type.



A Novel Hand Stamp.

The failure of the Scotch railway strike was due to the employment of imported workmen by the companies.

No. 12 Union Bicycle.

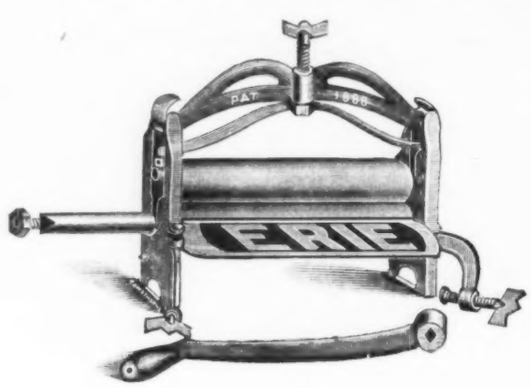
The Union Bicycle Mfg. Company, Highlandville, Mass., are putting upon the market for the season of 1891 a new bicycle, as illustrated herewith. Both the front and rear wheels are 30 inches. The machine has tangent spokes, nickeled to the lacing; hollow rims, diamond spring frame of weldless steel tubing, rear brake, ball bearing long steering head, patent adjustable saddle and chain adjustment.

No. 12 Union Bicycle.

Its weight is 44 pounds. Referring to the spring frame, it is stated that the front fork is of a very strong design, but light and handsome, all made of weldless steel tube excepting the fork head, which is steel drop forged. At the bottom of the side tubes is pivoted by means of a ball-bearing joint the auxiliary fork through which it is designed to communicate the vibration from the wheel to a coiled wire spring at the upper end, which is intended to immediately absorb it, thus relieving the main body of the bicycle from the increased jar and strain attendant with road riding. The same arrangement is applied to the rear frame, to act in precisely the same manner. Another improvement referred to is the 10-inch closed ball steering head, in which the balls are held in place by a washer, so as to be perfectly free in the stock, but cannot fall out. Attention is directed to the saddle, for which are claimed lightness and easy adjustment, also to the power of the direct acting brake.

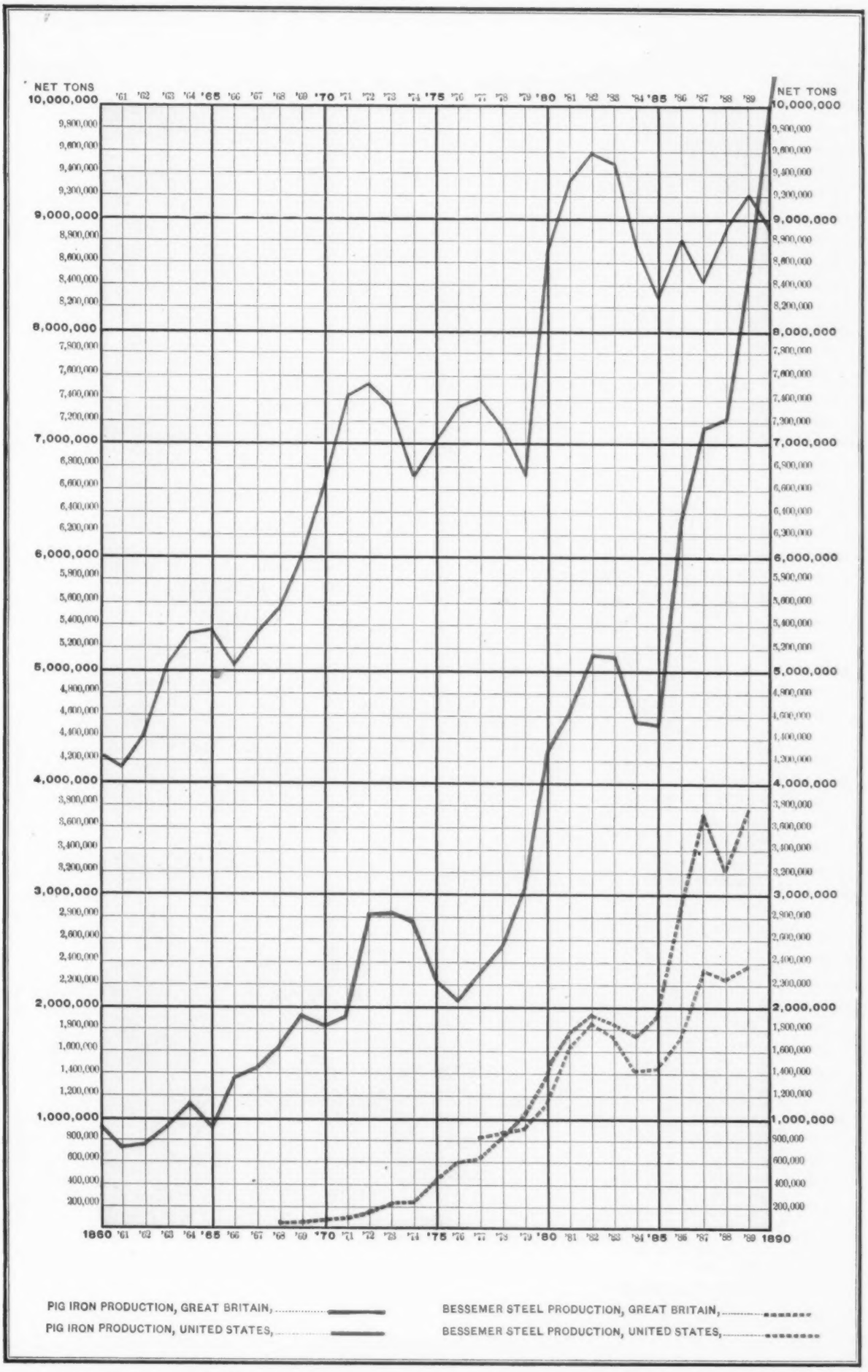
The Erie Wringer.

Erie Wringer Mfg. Company, Pittsburgh, Pa., are introducing a galvanized malleable iron frame wringer, as illustrated herewith. It has an oil-tempered elliptic spring, with a thumb screw in the center of the frame to give equal pressure to all parts of the rolls. It is stated that before leaving the factory every spring is submitted to a pressure of 1200 pounds. The clamps are made to fit round or square tubs, and the clothes board is wide, to prevent clothes clinging to the tub after being wrung. The manufacturers describe the rolls as made of patent vulcanized solid white rubber.



The Erie Wringer.

The Eureka manganese mines near Stanley, Va., and owned by W. J. Rosecrans and Max Speiden, have been purchased by an English syndicate for $200,000, and will be developed by the latter.



PRODUCTION OF PIG IRON AND BESSEMER STEEL IN THE UINTED STATES AND GREAT BRITAIN.

The Mammoth Mine Disaster.

As was briefly stated in our issue of last week, a terrible disaster occurred on Tuesday, the 27th ult., at the Mammoth Mine of the H. C. Frick Coke Company, located in the Connellsville region. The mine was said to be one of the best-equipped, best-managed and safest mines in the region, and the cause of the accident is enveloped in mystery. The fire boss had just completed his inspection of the mine and filed his report, pronouncing it safe. The pit was notably free from gas and its ventilation exceptionally good. Safety lamps were provided by the company, but they were not generally used by the miners, because of the general belief that they were an unnecessary precaution. In support of their claim that they have been careful to secure the safety of their employees, the H. C. Frick Coke Company have made public the following letters. The first was issued on November 15, 1888, and read as follows:

To Superintendents and Mine Bosses:

The newspapers of last week furnish two warnings of the danger from gas in the mines, and I would suggest that you take advantage of them to impress on your men the necessity of care and vigilance in every mine where the lives of men are at stake.

The second was sent out just after the accident at the Dunbar mine last summer, and reads as follows:

The late disaster at the Hill Farm mines should serve as a reminder and warning to us all that we are liable to have accidents of the same kind, and we should spare neither time, labor or expense to guard against them. We should always keep the fact prominently in our minds that it is the desire of our company, and our duty as well, that we make the safety of the lives of our employees our first and most important business. If we have any weak places in the ventilation or in any of the appliances for operating our mines have them strengthened and made secure at once, and see that they are kept in that condition. Accidents will happen in the best governed and best equipped mines, and the knowledge of this fact is all the more reason why we should be ceaseless in our efforts and watchfulness. You should guard especially against fire and allow nothing in the mine that would likely cause a fire. Where you have gas, be sure you have competent, reliable and sober men for fire bosses. Study well the mining law, and always do more than the law requires. It would be well, too, for you to assume you had a fire or an explosion in your mines, and think out what would be the best thing to do, and what you would need to extinguish a fire or to give relief to the injured, or to rescue imprisoned men, and provide every thing you would likely need in such a case. It is very important that stairways, air shafts, manways and other means of ingress and egress to and from the mine be kept open and in good condition always. Do not overlook this under any circumstances, and have as many openings as possible.

It is estimated that about 115 men lost their lives at the Mammoth Mine disaster, and search is being made for four men who are still missing. Subscription lists have been opened for the benefit of the sufferers and the H. C. Frick Coke Company have donated $25,000 to the fund, and stand ready to increase this amount if necessary.

Still another tunnel under the Hudson River is contemplated by the New York and New Jersey Terminal Railroad Company, just incorporated. The proposal is to provide a direct entrance into New York City at the foot of Fourteenth street for the lines which now have their termini in Jersey City, including the Pennsylvania, New Jersey Central and D., L. and W. From the river there will be two branches, one eastward and one southward. The point of junction in New Jersey is near Kearny. The trustees of the new corporation are Thomas Sturgis, William C. Lane, George H. Taylor, Isaac D. Fletcher, Thomas Rutter, A. R. Herriman, William C. Cox, Charles F. Smillee, Isaac P. Martin, Gen. Henry W. Slocum, C. P. Mackie, Welcome R. Jarvis and William Marshall. The estimated cost of the work is $12,000,000. The promoters probably have little faith in the ability of the Hudson River Tunnel Company to secure adequate space in New York City for terminal arrangements.

The Pittsburgh and Western Railroad.

The New York *Tribune* discusses the bearings of the recent acquisition of the Pittsburgh and Western Railroad by the Baltimore and Ohio interest, a change of control which is so important to Pittsburgh iron manufacturing interest. Our contemporary says:

To understand the situation clearly, it is only necessary to glance at the railway map. The line of the Baltimore and Ohio from Chicago reaches Chicago Junction about 200 miles east of Chicago, whence it diverges southward toward Wheeling. A continuation in a straight line westward from Chicago Junction to Akron, a distance of only 70 miles, would enable it to reach the Pittsburgh and Western system. Parties in its interest have been quietly completing this link during the last year, and it is to be opened for traffic in March. Another line from the West, which will have important connections to St. Louis, is also approaching completion, and this also connects with the Pittsburgh and Western system at Akron. The Baltimore and Ohio was therefore owner of the line from the seaboard to Pittsburgh and from Chicago to Akron, Ohio.

The Pittsburgh and Western, extending from Pittsburgh to Akron and constituting a funnel over which all through trains of the Baltimore and Ohio were compelled to pass, was not theirs. In addition to this, the Pittsburgh and Western line extended to the fine harbor of Fairport on Lake Erie, which gave it control of an enormous lake tonnage, the shipments for this year from Fairport having almost reached those of Cleveland. All this now becomes part of the Baltimore and Ohio system. The new line from Chicago to Pittsburgh over the Pittsburgh and Western is said to be superior to the Pittsburgh, Fort Wayne and Chicago, the distance being practically the same. Upon the completion of the line from Akron to Chicago Junction, 60 days hence, the Baltimore and Ohio will be in a position to divide the entire traffic between Pittsburgh and Chicago with the Pennsylvania line, and become in every respect a competitor upon equal terms for the Western through traffic to the seaboard.

There is another factor in this important step which may pass without the notice it deserves. The control of the Pittsburgh and Western has been obtained, not through purchase, but by exchange for Baltimore and Ohio stock of the stock held by the leading manufacturers of Pittsburgh in the Pittsburgh and Western, who constructed this road in order to prevent Pittsburgh from being unjustly discriminated against in the matter of freight rates. These parties control the traffic of the district, and their alliance with the Baltimore and Ohio as holders of their stock may be regarded as equally important as the through route itself, which has been so quietly acquired. The principal firms in Pittsburgh, it is said, have intimated that they intend to hold their shares and do their best to promote the interests of the Baltimore and Ohio line. The Baltimore and Ohio, upon their part, it is understood, have agreed that rates in the Pittsburgh district shall rise and fall with those in other districts, and that Pittsburgh shall not be discriminated against. As the manufacturers of Pittsburgh had no desire to engage in railway management beyond the extent necessary to secure this, they were perfectly willing to surrender control and management of the property to the Baltimore and Ohio, believing that in so doing and in strengthening that corporation the interests of the city of Pittsburgh would be best promoted.

The importance of Pittsburgh as a railway center is little appreciated; its railroad tonnage is enormous, and is said to exceed that of New York and Philadelphia combined. During the last year more than 6,000,000 tons of coke alone were shipped by rail from the Connellsville region, almost all of which is manufactured by the new shareholders of the Baltimore and Ohio, who are also the chief makers of iron and steel, embracing a total tonnage fully equal to that of coke.

The machinery for the binding twine plant at the Minnesota State prison will be soon in operation.

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CURRENT HARDWARE PRICES.

FEBRUARY 4, 1891.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Adjusters, Blind.

Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20&20&10%

Ammunition.—

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.00

Cartridges—
Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting.....15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—
First quality 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands.....33⅓&10&2%
Seibold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax..65&2%

Shells Loaded—
Standard List, July 19, 1890.....40&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up..	68¢	Dis. 20&2
U.M.C.&W. R. A.—B. E., 9&10...	82¢	
U.M.C.&W. R. A.—B. E., 8.....	96¢	
U.M.C.& W.R.A.—B. E., 7.....	$1.10	
U.M.C.&W. R. A.—P. E., 11 up..	1.15	
U.M.C.&W. R. A.—P. E., 9&10..	1.50	
U.M.C.&W. R. A.—P. E., 8.....	1.70	
U.M.C.&W.R.A.—P. E., 7.....	1.80	

Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80

Anvils.—

Eagle Anvils, ₩ ℔ 10¢.....15@15&5%
Peter Wright's.....11½@12¢
Armitage's Mouse Hole.....10½@11¢
Armitage's Mouse Hole, Extra.....12@12½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.
Rockford Bit Company
} 70&10%

Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32¼ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits.....50&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood..40&10%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26 ₩ .35@35&5%
Ives' No. 4, ₩ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.10.....25&10%
Bee.....25&25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives
French, Swift & Co.
Douglass'
} 33⅓ @ 33⅓&10%

Bonney's Adjustable, ₩ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25&25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common ₩ gr $1.70, 35%
Awls, Should. Peg. ₩ gr $2.45, 40@40&10%
Awls, Pat. Peg...₩ gr 63¢.....40@40&10%
Awls, Shouldered Brad...2.70 ₩ gr.....35%
Awls, Handled Brad...$7.50 ₩ gr.....45%
Awls, Handled Scratch ₩ gr, $7.50.35&10%
Awls, Socket Scratch, ₩ doz. $1.50.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality	$8.00	$8.50
Others	7.50	8.0

Axle Grease—See Grease, Axle.

Axles—

No. 1 4½¢@5¢, No. 2 5½¢@6½¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
} 3 % cash

Concord Axles, loose collar.....5¢@6¢
Concord Axles, solid collar.....6¢@7¢
National Tubular Self-Oiling.....33⅓&33⅓&5%

Bag Holders.—See Holders Bag.

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ dos	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Bars.

Crow—
Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)...₩ doz $3.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral (H. & R. Mfg. Co.).....₩ gro $4.50
Improved Acme (H. & R. Mfg. Co.).....₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co.....₩ doz $5.50

Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20 %

Bells—

Cow—
Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky.....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Electric.
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%

Hand—
Light Brass.....75&10%
Extra Heavy.....65&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Bellows—

Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@70&5%
Standard.....60&10&10@70%
Extra.....50&10@60%
N.Y.B.&P.Co., Carbon...50&5@50&10&5%
N.Y.B.&P.Co., Diamond....40&5@40&10%

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889.....60&10&10@70%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Boards, Stove.

Wood Lined "Crystal".....50%
" Embossed".....50%
" Oxidized".....45%
Paper Lined Zinc.....55%
" Crystal".....55%
" Embossed".....55%
" Oxidized".....45%

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....70@10&5&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890.....75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's...60&10%
Wr't Shutter, Brass Knob, " ...40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.&K.Flush, Corn'a " ...55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Ray State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.

Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Borax.....₩ ℔ 9½@10¼¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per ℔.....2¾¢

Braces.—

American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 28, 26.....60&10&5%
Nos. 13, 26, 30, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25¢

Amidon's

Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$3.25
Buffalo Ball.....$1.10@$1.15

Barber's,

Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%

Saxton's,

Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15

Bartholomew's,

Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent list, 55&10@55&10&10%
Shelf, fancy, Sargent s list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-Basting. { Inch 9 10 9x11 / Per doz $4.50 5.50 6.50
New Haven.....50%

Buckets, Well.

Galvanized—
Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass.....75&10@80%
Cast Brass, Tiebout's'.....50%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Japanned, Plated Tips
} ..70&10 @ 75%

Wrought Steel—
Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad.
Table Butts, Back Flaps, &c
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
} .70&10 @75%

Bronsed Wrought Butts.....50

Calipers—See Compasses.

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's, One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry.....10&10&10&10%
Cotton.....10&10&10%
Wool.....10&10&10%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—See Ammunition.

Casters—

Bed.....
Plate.....
Shallow Socket.....
} Brass...55&55&10% / Others...60@60&10%

Deep Socket.....40&10%
Yale Casters, list May, 1884...35&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10&5%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Cement.

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised April 21, 1890.....50& 10@60%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ½¢@¾¢ ₩ ℔.
German Coil, list Oct. 6, 1890.....50&10&5@60%
German Halter Chain, list Oct. 6, 1890.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35&2%
Covert Heel Chain.....50&2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ ℔ 5½¢@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—

White.....₩ gr 50¢
Red.....₩ gr 70¢
Blue.....₩ gr 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.
New Haven
Witherby
Mix
Ohio Tool Co.
} ..75 @ 75&10

Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&2%
L. & I. J. White.....30@30&7%

Tanged and Miscellaneous.
Tanged Firmers.....40&10&5%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels, ₩ ℔.....15&10%

Chucks–

Beach Pat.....each, $5.00.....20%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Graham Patent.....33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.

Tiffin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each, 6 gal., $2 60; 10 gal., $2.75; 15 gal., $3.00; 20 gal. $3.25.

Clamps–

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30&30&10%
Stearn's Adjustable Cabinet and Corner.....30&30&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co. 40&10%
Eberhard Mfg. Co.....40&5&40&10%
Warner's.....40&10&40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@35&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips–

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....66⅔&5&70%
Norway Spring Bar Clips, 5-16..20&5&5%
Wrought-Iron Felloe Clips.....₩ lb, 5½¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....15%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....60&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%

Compasses, Dividers, &c.–

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord–

Sash.

Common.....₩ lb 10@11¢
Patent, good quality.....₩ lb 13@13½¢
White Cotton Braided, fair..₩ lb 26 @ 27¢
Common Russia Sash.....₩ lb 13½¢
" " " .....₩ lb 15¢
Patent " .....₩ lb 15¢
Cable Laid Italian Sash.....₩ lb 22@23¢
Indian Cable Laid " .....₩ lb 19¢
Silver Lake–
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....28@30%
B Quality, Drab, 55¢.....31@33%
C Quality, White (only).....26@27¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson–
Braided, White Cotton, 50¢...30&30&5%
Braided, Drab Cotton, 55¢....30&30&5%
Braided, Italian Hemp, 55¢...30&30&5%
Braided, Linen, 80¢.....30&30&5%
Tate & Co. Braided Wire, ₩100 ft.....54¢

Wire Picture.

Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut–

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles–

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gr, 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins, Curtain

Cutters–

Meat.

Dixon's ₩ doz.....40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's ₩ doz.....40&5%

Nos.	100	150
	$15.00	$18.00

Hales Pattern ₩ doz.....70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Great American Meat Cutter.....30%

Nos.	112	116	118	120	122
Each	$2.00	$2.75	$3.00	$2.50	$4.00

Miles' Challenge ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₩ doz, $26.00, 55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

.....30@25%
Great American.....30%
Beef Shavers (Enterprise).....20&10@30%
Little Giant.....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.

Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%

Washer.

Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's.₩doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....35&10%

Cutlery–

Pocket and Table.....Net prices
Wostenholm..New list in preparation

Dampers, &c–

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.–

Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. 15.00
Kohler' New Champion.....₩ doz. $9.00
Schniedier.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50%
Imperial, ₩ doz $15.....45%

Dividers–

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18&$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks–

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85

Twist Drills–

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20@20&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
P. S. & W.....70%
Knapp & Cowles:
No. 1.....60&10@70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos, 4 and 00, Acme and Ideal..50& 5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩doz $6.00,25&10%
Syracuse Screw-Driver Bits..30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits ....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour.CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ lb	4½¢	5 ¢	2½¢
½ kegs, ₩ lb	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ lb	5 ¢	5¾¢	3 ¢
10-lb cans, 10 in case	6 ¢	6¾¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.

List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Fasteners, Blind–

Mackrell's, ₩ doz. $1.00.....30@20&10%
Van Sand's Screw Pat., $18 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.–

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..40%
Metallic Key, Leather Lined....60&10@ 60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....40%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $50.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.–

Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files–

Domestic–

Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60& 10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%

Imported–

Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 5%

Fixtures.

Grindstone–

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks–

Hay, Manure, &c., Asso List..65&5@65&10%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames–

Saw–

White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door–

Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@35&10%

Freezers, Ice Cream–

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10%
Zero and Pet.....65&10%
Boss.....65&10&10%
Keystone, P. D. & Co., each, $1.50....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro.....30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz.....25%

Furnaces, Soldering.

Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. 3 Gem, copper reservoir, 8.50

Fuse– ₩ 1000 ft

Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 3.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr. 4.85
Triple Taped Fuse, for very wet gr.. 5.80
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water, 12.00

Gates, Molasses–

Stebbin's Pattern.....75&10&5@80%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....30%
Lincoln's Pattern.....70&10&10%
Weed's.....40&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@30%
Wire, P. S. & W. Co.....10&10%

Gimlets–

Nail and Spike.....60&10&5%
" Eureka " Gimlets.....40&10%
" Diamond " Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45&45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
" Bee," ₩ gr $12.....25@25&5%

Glue–

Le Page's Liquid.....25@25&5%
Upton's Liquid.....33⅓%
The Le Page Co.'s Improved Process 25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs..₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 35¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones–

Small, at factory.....₩ ton $7.50@9.00

Grindstone Fixtures—See Fixtures, Grindstone.

Hack Saws—See Saws.

Hafts, Awl.

Sewing, Brass Fer.₩ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top.₩ gr $10.00...45&10%
Pat. Peg, Leather Top.₩ gr $12.00.45&10%

Halters.

Covert's, Rope, ¼-in. Jute.....50&2%
Covert's, Rope, ¼-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%
Covert's Adj. Web Halters.....35&2%

Hammers–

Handled Hammers–

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Fayette R. Plumb.
C. Hammond & Son.
Verree.
} 50@50&10%
Hartford, Nail Hammers...35&10@40&2%
Hartford, Machinists, &c.....50@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....30@35
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges–

3 lb and under.....₩ lb 40¢
3 to 5 lb.....₩ lb 36¢ } 70@70&10%
Over 5 lb.....₩ lb 30¢
Wilkinson's Smiths.....10½¢@11½¢₩ lb

Handcuffs and Leg Irons—See Police Goods,

Handles–

Atkins' No. 1 Loop, ₩ pair, 23¢; No. 13¢; No. 6, 16¢; No. 2 and No. Reversible, 18¢.

Cross-Cut Saw Handles–

Boynton's Loop Saw Handles, 50¢....60%
Champion.....15%

Iron, Wrought or Cast–

Door or Thumb.

Nos.	0	1	2	3
Per doz.	$0.90	1.00	1.15	1.35

1.50
60&10 &10

Roggin's Latches.....₩ doz 30¢@35¢
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88 ..... net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50 } 40&10%
Hickory Firmer Chisel, large. ₩ gr 5.00 }
Apple Firmer Chisel, ass'd...₩ gr 5.00 } 40&10%
Apple Firmer Chisel, large...₩ gr 6.00 }
Socket Firmer Chisel, ass'd...₩ gr 3.00 } 40&10%
Socket Framing Chisel, ass'd. ₩ gr 5.00 }
J. S. Smith & Co.'s Pat File.....50
File, assorted..... ₩ gr 2 75 }
Auger, assorted.....₩ g- 5.00 } 50%
Auger, large.....₩ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass..... ₩ set $1.2
Pat. Auger, Swan's..... .....₩ set $1.0
Hoe, Rake, Shovel, &c. ....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track 65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₩ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₩ ft, 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₩ set $6.00.....20%
Eclipse.....20&10%
Felix, ₩ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₩ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....45%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's
Hunt's
Hurd's
Mann's
Peck's
Underhill's. } 40 & 10 @ 50&5 %
Buffalo Hammer Co.
Fayette R. Plumb.
C. Hammond & Son.
Kelly's.
Sargent & Co.
P., S. & W. Co.
Ten Eyck Edge Tool Co.
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour .....70&2%
Huffer 50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible. ..70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10@2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50. .....10%

Gate Hinges—

Western.....₩ doz $4.40, 60%
N. E.....₩ doz $7.00, 55%
N. E. Reversible.....₩ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₩ doz $5.00, 55&10%
Automatic .....₩ doz $12.50, 50%
Common Sense.....₩ doz pair $4.50, 50%
Seymour's..... ... 45&10%
Shepard's ....60&10&5%
Reed's Latch and Hinges. ₩ doz $12.00, 50%

Spring Hinges—

Union Spring and Blank Butts.....40%
Gear's Spring Hinge Co.'s list, March 1886 ....20%
Acme.....30%
J. S.....25&10%
Empire and Crown.....20%
Hero and Monarch 55%
American, Gem, and Star.....20%
Oxford.....20%
Parker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Stearn's.....50&10%
Niagara, Holdback pattern, per gross. $14.00

Wrought Iron Hinges

Strap and T .....75&10%
Corrugated Strap and T.....75 & 10 %
Screw Hook and Strap. { 6 to 12 in., ₩ ℔. 4¢ / 14 to 20 in., ₩ ℔.3½¢ / 22 to 36 in., ₩ ℔. 3¢
Screw Hook and Eye.... { ⅛ in., ₩ ℔ 7¾¢ / ⅜ in., ₩ ℔ 5¾¢ / ¾ in., ₩ ℔ 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges { 8, 10 & 12 in., ₩ ℔.....5¢ / "Providence" { over 12 in., ₩ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co.,S.& O. Pat. { 50&10&5 / Am. Axe and Tool Co., S. & O. Pat. { @60%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub ....60&10%

Handled—

Garden, Mortar, &c..... 65&5@65&10%
Planter's, Cotton &c.....65&5@65&10%
Warren Hoe.....60%
Magic ... .₩ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₩ doz $18.....60%

Bit.

Extension,
Barber's, ₩ doz $15.00.....40@40&10%
Ives, ₩ doz $20.00.....60&5@60&10%
Diagonal.. .....₩ doz $24.00, 40%
Angular..... ₩ doz $24.00, 40&5%

File and Tool—

Balz Pat.....₩ doz $4.00; 25%
Nicholson File Holders..... 20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list..... } 60&10&10%
Bird Cage, Reading..... }
Clothes Line, Sargent's list.. }
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling Sargent's list. .....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading..50&10@50&10&10%

Wrought Iron—

Cotton.....₩ doz $1.25
Cotton Pat. (N.Y.Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....60%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt. .....80@80&10%
Atlas, Coat and Hat.....60%

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₩ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks .....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra..... 50&10@60%
N. Y. R. & P. Co., Para..... .....25&5%
N. Y. R. & P. Co., Extra..... ..40@40&5%
N. Y. R. & P. Co., Dundee... 50&10 @ 60%

Huskers—

Blair's Adjustable..... ..₩ gr $8.00
Blair's Adjustable Clipper. ..₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₩ 100 ℔. $2.30@$2.40
Self-Heating.....₩ doz $9.00 net
Self-Heating, Tailors'....₩ doz $18.00 net
Mrs. Pott's Irons..... .....50&5%
Enterprise Star Irons.. .....50&5%
XX Cold Handle Sad Irons ....50&5%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons..... .....25%
B. B. Sad Irons, ₩ ℔.....3 @3¼¢
Combined Fluter and Sad Iron, ₩ doz, $15.00 .....15%
Fox Reversible, Self-Fluter ₩ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England..... .....5¢, 15%
Mahony's Trov Pol. Irons.....25%
Sensible, list Jan. 91..... .....50&10&5%
Sensible Tailor's Irons..... .....33⅓ %
National Self-Heating..... .....30%

Soldering—

Soldering Coppers..... ₩ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy..... .....33⅓%
Victor..... .....33⅓%

Kettles— Spun. Stamped.
Brass, 7 to 17 in., ₩ ℔.... 24¢ 22 ¢
Brass larger than 17 in., ₩ ℔..... 26¢ 24½¢
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₩ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson s Butcher Knives, 1st Oct, 1, 1890 .....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c 40%
Jordan's AAA1, Butchers', list.....net
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₩ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Corn—

Bradley's..... .....10%
Wadsworth's..... .....25%

Drawing—

Witherby. }
P. S. & W ..... } .75 @ 75&10 %
Mix .....
New Haven.....
Merrill .....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning..Mfrs'. price ₩ doz $18.00, 25% But jobbers cut this price freely, often selling at $8 @ $8.50.
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₩ doz $11.00@$11.50
Heath's ....₩ doz $13.00@13.50
Auburn Hay, Corn. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay .....₩ doz.$7.00 @ $8.00

Mincing.

Am. (2d quality), ₩ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's..... .....20&10%
Smith's, ₩ doz, Single, $2.00: Double, $3 40@45%
Knapp & Cowles. .....50&10@60%
Buffalo Adjustable.....₩ doz $3.00 .25%
Buffalo Double Adj'table. ₩ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladles.— Melting, Sargent's.....55&10%
Melting, Reading. .....35&10%
Melting, Monroe's Pat...₩ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₩ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₩ doz less.

Miscellaneous.

Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....60%&10%
Hotchkiss..... .....30%
Peck, Stow & W. Co..... .....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass..... .....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Sept. 1, 1890.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.....
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 18 19 20
100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ doz $7.50, 20%

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan.1,'85..33½&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96..... .....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin..33⅓%
Yale.....net prices
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar.20, 1889. } 65&10@70 Much lower net prices often made.
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co.,list Aug.1, '88 .....
Reading Hardware Co., list Feb. 2, '88.....
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....35%&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock... .....25%

Padlocks—

List Dec. 23, '84.....75&10%
Brittan, Graham & Mathes.....75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₩ doz, $9. 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 130 and 140... ....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 41 line.....45&5%
No. 31 line.....60&5%
No. 21 line.....75@5%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₩ gr. ..33⅓%
Ferguson's 33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....60%&10@60%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed..... ₩ gr $4.00
Common Sense, Nickel Plated ₩ gr $10.00
Universal 30%
Kempshall's Gravity.....60%
Kempshall's Model .....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks..25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Liesche's, Nos. 100 and 110, ₩ gr $8; 105, $10.00. .....20&10%
Davis, Bronze, Barnes Mfg. Co..... 50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₩ gro $4.80

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₩ dos, $1.75; ₩ gross..... .....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.	
Douglas	$6.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	4.40@4.50	10%
Jennings	5.50	6.75	4.45@4.50	10%
Other Machines	2.35	2.75		
Phillips' Patent with Augers	7.00	7.50		

Fluting.

Knox, 4½-inch Rolls .....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll. $2.15..... .....35%
Eagle, 5½-inch Roll, $2.85..... .....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each 35%
Crown Jewel, 6 in .....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each..... .....35%
Domestic Fluter ..... each, $1.50
Geneva Hand Fluter, White Metal ₩ dos $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00. ....20%
Shepard Hand Fluter, No. 85 ₩ dos 15 20 ....40%

Snepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo ..... ₱ doz $10.00.....10%

Hoisting—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block.....40%
Energy Mfg. Co's.....25%

Washing—
Anthony Wayne, ₱ doz No. 1, $51; No. 2, $45; No. 3, $42.

Mallets.
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Mattocks. Regular list. 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Mills.
Coffee—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10&30%
The Swift, Lane Bros.....20&10%

Mincing Knives — See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers — See Drawers, Money.

Muzzles—
Safety.....₱ doz, $3.00, 25%

Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15,'89.....75&10%
Tack Mfrs.' list.....70%
Wire Nails, Standard Penny.
Card June 1, '89, base.....$2.35 @ $2.45

Horse—See Trade Report.
Nos. 6 7 8 9 10
Ausable.... .28¢ 26¢ 25¢ 24¢ 23¢. 40&5&2%
Clinton, Fin..19¢ 17¢ 16¢ 15¢ 14¢.....30%
Essex .....28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra..... .19¢ 17¢ 16¢ 15¢ 14¢.....30%
Snowden 19¢ 17¢ 16¢ 15¢ 14¢.....30%
Putnam.....23¢21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan.....28¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 25@25&5%
Globe.....23¢ 21¢ 20¢ 19¢ 18¢. 20&5&5%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢. 20&5&5%
A. C.....25¢ 23¢ 22¢ 21¢ 21¢. 25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 21¢. 25¢10@33⅓&5%
Maud S.....25¢ 23¢ 22¢ 21¢ 21¢. 40&10%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 25&1C&10%
New Haven..28 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell....28¢ 26¢ 5¢ 24¢ 23¢. .35&5@35&10%
Star.....23¢ 21¢ 19¢ 19¢ 18¢. 10&10@10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed.....14 ₱ ℔.

Picture—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—
Nuts, off list Dec. 18,1889: Square. Hex.
Hot Pressed..... 5.25¢ 5.85¢
Cold Punched..... 4.95¢ 5.05¢
In packages of 100 ℔, add 1-10¢ ₱ ℔. net: in packages less than 100 ℔, add ½¢ ₱ ℔, net.

Oakum—
Government.....₱ ℔ 7@7½¢
U. S. Navy.....₱ ℔ @6½¢
Navy.....₱ ℔ 5½@6½¢

Oilers—
Zinc and Tin .....65&10&70%
Brass and Copper .....50&10&50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper 50%
Broughton's Zinc.....60%
Broughton's Brass 50%
Gem P. D. & Co. .....₱ gro. $2
Steel, Draper and Williams.....50%

Openers, Can.
Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4 French.....₱ doz $2.25, 55@60%
No. 5, Iron Handle.....₱ gr $6.00, 45@50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2 75@3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00 2, $2.25; 3, $2.50-50&10&10%
Excelsior No. 1 $2.50; No. 2, $1.59....40%
World's Best, ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00..... 55&5%
Domestic, ₱ doz $2.50..... 45%
Champion ₱ doz $2.00..... 50%

Packing, Steam—

Rubber—
Standard.....60&5@65%
Extra .....50@50&5%
N. Y. B. & P. Co., Standard..40&10@50%
N. Y. B. & P. Co., Empire.....60&5@65%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 10@15%
Jenkins' Standard. ₱ ℔ 80¢,...25@25&5%

Miscellaneous—
American Packing.....10¢@11¢ ₱ ℔
Russia Packing .....14¢ ₱ ℔
Italian Packing .....13¢@14¢ ₱ ℔
Cotton Packing .....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—See Locks.

Pails.

Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Helwig's.	2.50	2.75	3.00
Sidney Shepard & Co.	2.35	2.85	3.05
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt .....₱ doz $6.00
Fire, Stable and Milk, 14 qt ..₱ doz $7.80

Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No.1, 12 qt. per doz	4.50	
Fire Pails, No.2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bail, trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.

Dripping.
Small sizes.....₱ ℔ 6¼¢
Large sizes.....₱ ℔ 5½¢
Silver & Co. (Covered).....40%

Dry—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.		5	6	7	8
₱ doz.		$6.00	$7.00	$8.00	$9.00

Polished, regular goods.....70&10%
Acme Fry Pans .....60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1886.....50&50&10%
Sibley's Emery and Crocus Cloth.....30%

Parers.

Apple.
Advance.....₱ doz $4.75
Baldwin.....₱ doz 5.25
Bonanza.....each 5.00
Champion.....₱ doz 7.25
Daisy.....₱ doz 4.00
Dandy.....each 7.50
Eureka, 1888.....each 16.00
Family Bay State.....₱ doz 12.00
Favorite.....₱ doz 5.00
Gem.....₱ doz 5.25
Gold Medal.....₱ doz 4.00
Ideal.....₱ doz 4.00
Improved Bay State..₱ doz 27.00 @ 30.00
Little Star.....₱ doz 4.50
Monarch.....₱ doz 13.50
New Lightning.....₱ doz 5.50
Oriole.....₱ doz 4.00
Penn.....₱ doz 4.00
Perfection.....₱ doz 4.00
Pomona.....₱ doz 4.00
Rocking Table.....₱ doz 6.00
Turntable.....₱ doz 4.50
Victor.....₱ doz 13.50
Waverly.....₱ doz 4.00
White Mountain.....₱ doz 4.00
72.....₱ doz 4.25
76.....₱ doz 5.75
78.....₱ doz. 6.50

Potato—
White Mountain .....₱ doz $4.50
Antrim Combination.....₱ doz $5.50
Hoosier.....₱ doz $13.50
Saratoga.....₱ doz $5.50

Pencils—
Faber's Carpenters'..... ..high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters' ....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.

Bow—
Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W Co... 50&10@50&10&5%

Curtain—
Silvered Glass.....net
White Enamel.....net

Escutcheon,
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 47½%
1¼ and under, Galvanized 40%
1½ and over, Plain.....60%
1½ and over, Galvanized 47½%
Boiler Tubes, Iron, all sizes.....50%

Planes and Plane Irons—

Wood Planes—
Molding.....30&2%
Bench, First Quality.....45&2%
Bench, Second Quality.....50&2%
Bailey's (Stanley R. & L. Co.'s. .. 40&10%

Iron Planes—
Bailey's (Stanley R. & L. Co.).....
40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) .....20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.). .....20&10@20&10&10%
Steer's Iron Planes.....35@35&10%
Merrien Mal. Iron Co.'s.....40@40&10%
Davis's Iron Planes .....40@40&10%
Birmingham Plane Co.....50@50&10%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes .....40@40&10%
Sargent's ..... 30&10@30&10&10%
Standard Tool Co.....50@50&5%

Plane Irons—
Butcher's.....$5.00@$5.25 to £
Buck Bros 30%
Auburn "Thistle.....
Ohio..... } 35&2%
Sandusky.....
S. & I. J. White.....25%

Plates.
Felloe .....₱ ℔ 6¢@6½¢

Pliers and Nippers—
Button's Patent.....50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz .....20&10@33⅓%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel.....25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00.....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List .....70&10@70&10&10%
Disston's.....50%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers .....10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00..... 25%
Silver & Co., 6-Ring..₱ doz $4; 3-Ring $2

Pokes, Animal—
Bishop's I. X. L.....₱ doz $6.00
Bishop's O. K.....₱ doz $5.25
Bishop's Pioneer.....₱ doz $3.75
Bishop's American.....₱ doz $2.75
Eagle, Double Stale.....₱ doz $5.75
Eagle, Single Stale.....₱ doz $3.75
Buckeye, Single Stale.....₱ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00: 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish, Metal.
Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Polish, Stove.
Joseph Dixon's.....₱ gro $6.00, 10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror .....₱ pro $6.00, —%
Lustro .....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots .....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ 8¢
Boynton's Noon Day, ₱ gro 13.00
Parlor Pride Stove Enamel..₱ gro
Yates' Liquid, 2 3 5 10 gal.... ₱ gal ...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 12½¢
Jet Black .....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish.₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans .....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans .....12½¢
Nickel Plate Paste .....₱ gro $6.00
Crown Paste .....₱ gross, $7.20
Crown Paste, in 5 and 10 ℔ pails ₱ ℔ 12¢
Black Flag .....₱ gross, $7.20
Black Flag, 5 and 10 ℔ pails,....₱ ℔ 12¢
Black Flag, liquid, in bottles, ₱ gro..$8.00

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1½ qt..₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy" 50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co.....20&10@30%
Henis .....₱ doz $3.50
Shepard's Queen City 40%
Silver & Co.....₱ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton .....₱ doz $18.00, 33⅓%
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $18.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw..... 60&10%
Brass Screw .....60&10%
Japanned Side..... 66⅔&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley .....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 .....50%
Hay Fork, "P" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack 45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00... .....40%

Pumps—
Cistern, Best Makers .....60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check ..40%
Solid Tinners', P.S. & W.Co., ₱ doz $1.44, 55%
Tin'rs' Hollow Punches P.S. & W.Co.20&2%
Rice Hand Punches 15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door Light. In. ½ ¾ 1
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.25..net

Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot .....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods...66⅔&10%
Cast Steel, outside goods 60&10&10@70&5%
Malleable .....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15
Canton Lawn Rake.....$9.00, 50&10
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00..... .....25%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AAA1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1, '89.50%
Electric.....List net

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—
Top of the Hill Ringers. .....₱ doz $2.00
Top of the Hill Rings.....₱ doz $1.25
Hill's Improved Ringers ...₱ doz $1.25
Hill's Old Style Ringers.....₱ doz $1.12½
Hill's Tongs.....₱ doz $3.00
Hill's Rings.....₱ doz bxs $1.00
Perfect Rings.....₱ doz bxs $1.50
Perfect Ringers.....₱ doz $2.15@2.25
Blair's Hog Ringers.....₱ doz $2.00
Blair's Hog Rings.....₱ doz 90¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.15@1.25
Electric Hog R'ngs....₱ doz boxes $1.50
Electric Hog Ringers .....₱ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87.....40%
Copper.....50@50&10%
Coppered Iron, Bettina Brand. 40%

Rivet Sets—See Sets.

Rods—
Stair, Brass .....25&2%
Stair, Black Walnut .. ..₱ doz 40¢

Rollers—
Barn Door, Sargent's list .....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller 70%

Rope.
Manila...½ in. and larger .....₱ ℔ 11¾¢
Manila .....⅜ in. ₱ ℔ 12¼¢
Manila.....¼ and 5-16 in. ₱ ℔ 13¼¢
Manila Tarred Rope.....₱ ℔ 11 ¢
Manila, Hay Rope.....₱ ℔ 11½¢
Sisal.....½ inch and larger ₱ ℔ 8 ¢
Sisal .....⅜ in. ₱ ℔ 8½¢
Sisal.....¼ and 5-16 in. ₱ ℔ 8¾¢
Sisal, Hay Rope.....₱ ℔ 8 ¢
Sisal, Tarred Rope.....₱ ℔ 7½¢
Sisal, Medium Lathe Yarn.....₱ ℔ 6¾¢
New Zealand..½ in. and larger ₱ ℔ 7¾¢
New Zealand..... ⅜ inch, ₱ ℔ 8¼¢
New Zealand, ¼ and 5-16 inch, ₱ ℔ 9½¢
New Zealand, Hay Rope.....₱ ℔ 7¾¢
New Zealand, Tarred Rope....₱ ℔ 7½¢
Note.—Manufacturers' prices on above ₱ ℔ less, f. o. b. factory.
Cotton Rope.....₱ ℔ 15@18¢ net
Jute Rope.....₱ ℔ 6½@6¾¢

Wire—
List May 1, 1886.
Iron.....32½&2½%
Iron, Galvanized.....40&2½%
Cast Steel.....40&2½%

Rules—
Boxwood.....80&10&10@80&10&10&10%
Ivory.....50@50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
Disston's Circular 45%
Disston's Cross Cuts..... .....45%
Disston's Hand.....20%
Woodrough & McParlin.
Hand, Panel and Rip.....25%
Narrow Champion Cross Cuts with Handles, ₱ foot.....20¢
Champion Thin Back Cross Cuts, ₱ foot.....28¢
Champion Extra Thin Back Cross Cuts, ₱ foot.....31¢
One Man Champion Cross Cuts, ₱ foot.....40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....30%
Narrow Champion Cross Cuts with Handles, ₱ foot.....20¢
Champion Thin Back Cross Cuts, ₱ foot.....28
Champion Extra Thin Back Cross Cuts, ₱ foot.....31¢
One Man Champion Cross Cuts, ₱ ft. 40¢

Atkins' Circular Shingle and Heading dis 50%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 33¢
Atkins' Champion and Electric Tooth X Cuts ₱ foot 30¢
Atkins' Hollow Back X Cuts ₱ foot 20¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles, ₱ foot 40¢
Peace Circular and Mill 45%
Peace Hand Panel and Rip 25%
Peace Cross Cuts 45%
Richardson's Circular and Mill 45%
Richardson's X Cuts 45%
Richardson's Hand, &c. 25%
C. E. Jennings & Co., Hand, Panel and Rip 25%

Hack Saws—
Griffin's, complete 40&10@50%
Griffin's Hack Saw, Blades 40&10@50%
Star Hack Saws and Blades 25%
Eureka and Crescent 25¢

Scroll—
Lester, complete, $10.00 25%
Rogers, complete, $4.00 25%
Barnes' Builders' and Cabinet Makers', $15 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales

Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161 ₱ doz $6.75@$7.00
Union Platform, Plain $2.10@2.30
Union Platform, Striped $2.20@2.30
Chatillon's Grocers' Trip Scales 50¢
Chatillon's Eureka 25¢
Chatillon's Favorite 40%
Family, Turnbulls 80@80&10%
Riehle Bros.' Platform 40%

Scale Beams—See Beams, Scale

Scissors, Fluting 45%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50 30&10%
Box, 1 Handle ₱ doz $4.00, 10%
Box, 2 Handle ₱ doz $6.00, 10%
Defiance Box and Ship 20&10%
Foot 50&10@60%
Ship, Common ₱ doz $3.50 net
Ship, R. I. Tool Co. 10¢

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—
Bench, Iron 55&10@55&10&10%
Bench, Wood, Beech ₱ doz $2.25
Bench, Wood, Hickory 20&10%
Hand, Wood 25&10@25&10&5%
Lag, Blunt Point, list Jan. 1, 1890 75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 75@75&10%
Bed 25&5%
Hand Rail, Sargent's 60@60&10%
Hand Rail, H. & B. Mfg. Co. 70&10@75%
Hand Rail, Am. Screw Co. 75%
Jack Screws, Millers Falls list 50@50&5%
Jack Screws, P. S. & W. 35%
Jack Screws, Sargent 60&10@60&10&5%
Jack Screws Stearns' 40&10@40&10%

Cork—
Humason & Beckley Mfg. Co. 40&10@50%
Williamson's 33⅓@33⅓&5%
Howe Bros & Hulbert 35%

Machine—
Flat Head, Iron 55%
Round Head, Iron 50%

Wood—
List January 1, 1891.
Flat Head Iron 72½%
Round Head Iron 67½%
Flat Head Brass 72½%
Round Head Brass 65 %
Flat Head Bronze 72½%
Round Head Bronze 65 %
Rogers' Drive Screws 33⅓%

Scroll Saws—See Saws, Scroll.

Scythes.

Grass 40&5@40&10%
40&10@50%

Scythe Snaths—See Snaths, Scythe.

Seals.

Awl and Tool.
Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00 55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9. 25@25&10%
Miller's Falls Adj. Tool Hdls. Nos. 1, $12, 2, $18 25%
Henry's Combination Haft ₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50 70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 30&10%

Nail—
Square ₱ gr., $4.00@$4.25
Round ₱ gr. $3.25
Buck Bros 27½%
Cannon's Diamond Point ₱ gr. $12, 20%

Rivet.
Regular list 50&10%

Saw—
Stillman's Genuine ₱ doz $5.00@7.75, 40&5%
Stillman's Imita ₱ doz $3.25@4.25, 40&5@40&10%
Common Lever ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 2&4, $24.00. 40&10@50%
Leach's No 0, $8.00; No. 1, $15, 15@20%
Nash's 30&10@30&10&10

Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine $13.00, 50&10%
Aiken's Imitation $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star 25¢
Leopold 40&10@50%
Atkin's Lever ₱ doz No. 1, $6.00
Atkin's Criterion ₱ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 40&10%
Avery's Saw Set and Punch 50%
Chieftain H. R. Co.'s Superior ₱ doz $15, 50%

Sharpeners, Knife.

Parkin s.
Applewood Handles ₱ doz $6.00, 40%
Rosewood or Cocobolo ₱ doz $9.00, 40%

Shaves, Spoke.

Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) 40&10%
Stearns' 30&10%
Cincinnati 25&10%

Shears—
American (Cast) Iron 75&10@75&10&5%
Barnard's Lamp Trimmers ₱ doz $3.75
Tinners' 20&2%
Seymour's, List, Dec., 1881, 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881, 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears 33⅓%
First quality C. S. Trimmers 80@80&10%
Second quality C. S. Trimmers, 80&10@80&10&10%
Acme Cast Shears 10&10%
Diamond Cast Shears 10%
Clipper 10&10%
Victor Cast Shears 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Chicago Drop Forge & F. Co., Solid Steel Forged 60%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list, 60%
Electric List net

Pruning Shears and Hooks.
Disston's Combined Pruning Hook and Saw ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co. 60%

Tinners', &c.—
Shears and Snips (P. S. & W.) 20@25%
Snips, J. Mallinson & Co 33⅓%

Sheaves—

Sliding Door—
M. W. Co., list July, 1888 50&10@60&5%
R. & E., list Dec. 18, 1885 55&20%
Corbin's list 60&10&2%
Patent Roller 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—
R. & E. list Dec. 18, 1885 60&10&2%
Sargent's list 60&10%
Reading list 60&10&10%

Ship Tools—

L. & I. J. White 20&5%

Shoes, Horse, Mule, &c.—

Horse—
Burden's, Perkins', Phoenix, at factory. $4.00

Mule—
Add $1 ₱ keg to above prices.

Ox, Wrought—
Ton lots ₱ ₵ 9¢
1000 ℔ lots ₱ ₵ 9½¢
500 ℔ lots ₱ ₵ 10¢

Shot—
(Eastern prices 2¢ off, cash, 5 days.
Drop, ₱ bag, 25 ℔ $1.36
Drop, ₱ bag, 5 ℔ .32
Buck and Chilled, ₱ 25-℔ bag 1.61
Buck and Chilled, ₱ 5-℔ bag .37
(See Trade Report.)

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron 50&10%
Griffith's C. S. 50@60&10%
Griffith's Solid C. S. R. R. Goods 20%
St. Louis Shovel Co. 20@20&7½%
Hussey, Binns & Co. 15@25%
Hubbard & Co. 20@20&7½%
Lehigh Mfg. Co. 50&10%
H. M. Myers Co. 30 %
Payne Pettebone & Son 33⅓&5%
Remington's (Lowman's Pat.) 30&10@40%
Rowland's, Black Iron 50&10%
Rowland's Steel 60&5@60&10%

Shovels and Tongs—
Iron Head 60&10@60&10&5%
Brass Head 60&10&10%

Sieves—
Mann's Tin Rim 50&25%
Buffalo Metallic, R. S. & Co. 50&25%
Shaker (Barler's Pat.) Flour Sifters ₱ doz $2.00; ₱ gr $21.60
Electric ₱ gr $21.00
A. & W. Sifters ₱ doz $2.00
Hunter's ₱ doz $2.00
Smith's Adjustable Sifters ₱ doz $2.00

Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.35

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	80¢	$1.00
Mesh 20, Nested, ₱ doz..	95¢	1.10
Mesh 24, Nested, ₱ doz..	$1.15	1.25

Skeins, Thimble—
Western list 75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co. 60%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

Slates—
School, by case 50&10@50&10&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.) 65%
Fitch's (Bristol) 50&10%
Hotchkiss 10%
Andrews 50%
Sargent's Patent Guarded 70&10&10%
German, new list 40&10%
Covert 50&2%
Covert, New Patent 50&5&2%
Covert, New R. E. 60&2%
Covered Spring 60&10&10%

Snaths, Scythe.
List 50&10@50&10&10&5%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—
Cuspidors, 8¼-inch, ₱ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—
Basting, Cen. Stamp. Co.'s list 70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list 70&10%
Buffalo S. S. & Co. 33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers 40&15%
C. Rogers & Bros. 40&15%
Rogers & Bro. 40&15%
Reed & Barton 40@40&5%
Wm. Rogers Mfg. Co. 40, 15&5%
Simpson, Hall, Miller & Co. 40, 15&5%
Holmes & Edwards Silver Co. 40, 15&5%
L. Boardman & Son 50&12½%

Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver 50&10&5%
No. 30 Silver Metal 50&10&5%
No. 24 German Silver 50&10&5%
No. 50 Nickel Silver 60&5%
No. 40 Nickel Silver 50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal 50, 10&6%
18% Rogers' German Silver 60&6%
22% Rogers' Nickel Silver 50&6%
German Silver 50@50&5
German Silver, Hall & Elton 50&5% cash
Nickel Silver 50&5@50&10&5% cash
Britannia 60%
Boardman's N'ck'l Silver 40&7½&5% cash
Boardman's Britannia Spoons, case lots 50&12½&5% cash

Springs—

Door.—
Torrey's Rod, regular size ₱ doz $1.30
Gray's, ₱ gr., $20.00 20%
Bee Rod ₱ gr., $20.00 20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30 40&10@50%
Gem (Coil), list April 19, 1886 10%
Star (Coil), list April 19, 1886 20%
Victor (Coil) 60@60&10%
Champion (Coil) 60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75. %
Cowell's No. 1, ₱ doz, $18.00; No. 2, $15.00 50%
Rubber, complete, ₱ doz, $4.50 55&10%
Hercules 50%
Shaw Door Check and Spring 25@30@35%

Carriage, Wagon, &c.—
Elliptic, Concord, Platform and Ball Scroll 60&10&10%
Cliff's Boister Springs 25%

Squares—
Steel and Iron } 80 &10%
Nickel-Plated } 80 &10%
Try Square and T Bevels 60&10@60&10&10%
Disston's Try Square and T Bevels 50%
Winterbottom's Try and Miter 30&10%
Starrett's Micrometer Caliper Squares 25%
Avery's Flush Bevel Squares 40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—
Blair's ₱ doz $2.00
Blair's "Climax" ₱ doz $1.25

Lemon—
Porcelain Lined, No. 1 ₱ doz $6.00, 25&30%
Wood, No. 2 ₱ doz $3.00, 35%
Wood, Common ₱ doz $1.70@1.75
Dunlap's Improved ₱ doz $3.75, 20%
Samuels, No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz 25&10%
Jennings' Star ₱ doz $2.50
The Boss ₱ doz $2.50
Dean's Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant 60@50&5%
King 40&5%
Hotchkiss Straight Flash ₱ doz $12.00
Silver & Co., Glass ₱ gro. $9.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—
Barbed, ½ in. and larger ₱ ℔ 7@7½¢
Barbed, ⅜ in. ₱ ℔ 8@8½¢

Fence Staples, Galvanized. } Same price as B'rb Wire.
Fence Staples, Plain. } See Trd. Rep.

Steelyards 40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods 40&10@50%
Butterfield's Goods 40&10@50%
Lightning Screw Plate 25@30%
Reece's New Screw Plates 33⅓&5@40%
Reversible Ratchet 30 %
Gardner 25%

Stops, Bench.
Morrill's ₱ doz $9, 50%
Hotchkiss's ₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's ₱ doz $3 10%
Cincinnati 35&10%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone ₱ ℔ 2½¢
Washita Stone, Extra ₱ ℔ 20@21¢
Washita Stone, No. 1 ₱ ℔ 15@16¢
Washita Stone, No. 2 ₱ ℔ 11@12¢
Washita Slips, No. 1, Extra ₱ ℔ 37@40¢
Washita Slips, No. 1 ₱ ℔ 25@26¢
Arkansas Stone, No. 1, 4 to 6 in ₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in ₱ ℔ 40¢
Turkey Slips ₱ ℔ $1.00@1.50
Lake Superior, Chase ₱ ℔ 16¢
Lake Superior Slips, Chase ₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand ₱ ℔ 18@20¢
Seneca Stone, High Rounds ₱ ℔ 20@25¢
Seneca Stone, Small Whets ₱ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.
Cast Steel, Polished ₱ doz $2.25
Cast Iron, Steel Points ₱ doz 80¢
Socket ₱ doz $1.75
Bullard's 25@25&10%

Strops, Razor—
Genuine Emerson 60@60&5%
Imitation " ₱ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com ₱ doz $2.00
Lamont Combination ₱ doz $4.00
Jordan's Pat Padded, list Nov. 1, '89 50%
Electric List net

Stuffers or Fillers, Sausage—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry ₱ doz, No. 1, $15.00; No. 0, $21.00 50&5@50&10%
Draw Cut No. 4, each $30.00 20%
Enterprise Mfg. Co. 20&10@30%
Silver's 40&10%

Sweepers, Carpet.
Bissell No. 5 ₱ doz $17.00
Bissell No. 7 New Drop Pan. ₱ doz $19.00
Bissell, Grand ₱ doz $36.00
Grand Rapids ₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic ₱ doz $15.00
Jewel ₱ doz $17.00
Improved Parlor Queen, Nickeled ₱ doz $27.00
Japanned ₱ doz $24.00
Excelsior ₱ doz $22.00
Garland ₱ doz $18.00
Parlor Queen ₱ doz $24.00
Housewife's Delight ₱ doz $15.00
Queen ₱ doz $16.00
Queen, with band ₱ doz $18.00
King ₱ doz $30.00
Weed, Improved ₱ doz $18.00
Hub ₱ doz $16.00
Cog-Wheel ₱ doz $16.00
Conqueror ₱ doz $22.00
Easy ₱ doz $22.00
Monarch ₱ doz $22.00
Goshen ₱ doz $21.00

Tacks, Brads, &c.—

List Oct. 19, 1889. Standard Weights.

Carpet Tacks—
American Iron, Blued 77½%
Am'ican Iron, Tin'd or Cop'd 77½%
Steel, Plain or Bright 75%
Steel, Tinned or Coppered 75%
Swedes Iron, Blued 75%
Swedes Iron, Tinned or Cop'd 75%
American Iron Cut Tacks 75%
Swedes Ir. Uphol'rs' Tacks, Blued 75%
Swedes Iron Upholsterers' Tacks, Tinned 77½%
Gimp and Lace Tacks, Blued 75%
Gimp and Lace Tacks, Tinned 77½%
Swedes Iron Basket or Trimmers' Tacks 70&10%
Miners' Tacks 77½%
Bill-Posters' or Railroad Tacks 75%
Bill-Posters' or Railroad Tacks, Tinned 77½%
Copper Tacks 40%
Copper Finish & Trunk Nails 40%
Cigar Box Nails 50%
Zinc Glaziers' Points 50%
Picture-Frame Points 50%
Looking-Glass Tacks 50%
Brush Tacks 60%
Tin-Capped Trunk Nails 60%
Finishing Nails 70%
Trunk and Clout Nails, Black and Tinned 72½%
Common and Patent Brads 70%
Hungarian Nails 70%
Basket and Chair Nails 60%
Leathered Carpet Tacks 40%

Miscellaneous—
Double-Pointed, 120 count 35&10%
Wire Carpet Nails 50&10%
Plymouth Rock Steel Carpet Tacks 25%

Extra 10 @ 10&10 %

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....35@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale– Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....35%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Lumber.

Ring Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies....₩ doz $19.00
Cant Hooks, "Blue Line"..₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $18.00

Saw.

Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters — See Lifters, Transom.

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50 15%
Mouse, Bonanza.....₩ doz $0.90@$1.00
Mouse, Delusion.....₩ $1.00@$1.25
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering. 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—	BC.	B
No. 9, ¼ and ⅛ ℔ Balls	26¢	34¢
No. 12, ¼ and ⅛ ℔ Balls	25¢	33¢
No. 18, ¼ and ⅛ ℔ Balls	22¢	32¢
No. 24, ¼ and ⅛ ℔ Balls	22¢	32¢
No. 36, ¼ and ⅛ ℔ Balls	20¢	31¢

No. 264, Mattrass, ¼ and ⅛ ℔ Balls.52@54¢
Chalk Line, Cotton, ⅛ ℔ Balls.....25¢
Mason Line, Linen, ⅛ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....15¼¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16¼¢
3-Ply Hemp, 1½ ℔ Balls.....15¢@15¼¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls.....10¢
Wool.....6¼¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—

Solid Box.....50&10@50&10&5%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20¢
Massey Quick Action.....20 @ 25 %

Saw Fliers—

Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60⅓&10%
Hopkins'.....₩ dos $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%

Miscellaneous.

Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40 %

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....70%
Boilers and Saucepans..40&10@50&5%
Tinned Boilers and S'pans.40&10@50&5%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¼ in.		4.00
Cuspidors.		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.	4.00	
Half-peck Measure.	3.50	

See also Pails.

Indurated Fiber—25%

Spittoons, No. 2, ₩ doz.....$9.00
Basins, Ringed, ₩ doz., No. 2, $4.80; No. 3.....$4.20
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) ₩ set.....$3.00
Dry Measures, ½, ¼, ⅛ and 16 qts. (5 pieces), ₩ set.....$3 00

See also Pails.

Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.

Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
} 40&5%

Hartford Silver Plate Co.....
William Rogers Mfg. Co.....
} 40&5&5%

Washers—

Size hole	5-16	⅜	½	⅝ to 1⅜
Washers	6	5	2.9	2.65¢

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—

Iron.....₩ ℔ 2½¢.
Steel.....₩ ℔ 3½¢

Weights, Sash—

Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.

8 in., $2.25; 10 in., $2.70; 12 in., $3.38

Wire and Wire Goods—

Iron—

Market.
Br. & Ann., Nos. 0 to 13.....75%
Cop'd, Nos. 0 to 18.....72½%
Galv., Nos. 0 to 18.....65%
Tin'd, Tinned list Nos. 0 to 18.....65%
Stone,
Br. and Ann'd, Nos. 16 to 18.....75%
Bright and Ann'd, Nos. 19 to 26....77½%
Br. and Ann'd, Nos. 27 to 36.....80%
Tinned.....
Tinned Broom Wire, 18 to 21, ₩ ℔...5½¢
Galvanized Fence, Nos. 8 and 9.....67½%
Annealed Fence, Nos. 8 and 9.....77½%
Annealed Grape, Nos 10 to 14.....77½%
Brass, list Jan. 18, 1884.....30%
Copper, list Jan. 18, 1884.....30%
Barb Fence.....See Trade Report
Annealed Wire on Spools.....50%
Malin's Steel and Tin'd on Spools.....50%
Malin's Brass and Copper on Spools....40%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Copper and Brass.....45%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $2, 30%
Steel Music Wire, 12 to 30...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.

Bright Wire Goods—

Standard list.....85%

Wire Cloth and Netting.

Painted Screen Cloth, good quality, ₩ 100 sq. ft., $1.40 @ $1.45
Galvanized Wire Netting.....70&10@75%

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&3%
Coes' "Mechanics".....50&10&3%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard..70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
} 75& 5 @ 75 &10

Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....35%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$0.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&3%

Wringers, Clothes—

List September 20, 1890, 2% cash

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1886, 85@85&10%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	56	@	62
Linseed, City, boiled.....	61	@	65
Linseed, Western, raw.....	54	@	..
Lard, City, Extra Winter..	52	@	53
Lard, City, Prime.....	49	@	50
Lard, City, Extra No. 1.....	45	@	46
Lard, City, No. 1.....	42	@	43
Lard, Western, prime.....	48	@	49
Cotton-seed, Crude, prime.	28	@	29
Cotton-seed, Crude, off grades.....	20	@	25
Cotton-seed, Summer Yellow, prime.....	33	@	35
Cottonseed, Summer Yellow, off grades.....	28	@	32
Sperm, Crude.....	70	@	72
Sperm, Natural Spring.....	68	@	70
Sperm, Bleached Spring....	72	@	74
Sperm, Natural Winter.....	74	@	76
Sperm, Bleached Winter....	79	@	81
Whale, Crude.....	..	@	..
Whale, Natural Winter.....	..	@	52
Whale, Bleached Winter....	..	@	55
Whale, Extra Bleached.....	..	@	58
Sea Elephant, Bleached Winter.....	..	@	62
Menhaden, Crude, Sound...	25	@	27
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	28	@	29
Menhaden, Bleached W'ter.	31	@	32
Menhaden, Extra Bleached	35	@	..
Tallow, City, prime.....	..	@	44
Tallow, Western, prime....	..	@	..
Cocoanut, Ceylon.....	6¼@		7¼
Cocoanut, Cochin.....	8¼@		8½
Cod, Domestic.....	..	@	35
Cod, Foreign.....	..	@	35
Red Elaine.....	31	@	34
Red Saponified..... ₩ ℔	4½@		4¾
Bank.....per gal	..	@	25
Straits.....	..	@	26
Olive, Italian, bbls.....	68	@	70
Neatsfoot, prime.....	62½@		75
Palm, prime, Lagos....₩ ℔	6½@		6¾

Mineral Oils.

Black, 20 gravity, 25 @ 30 cold test.....per gal	6¼@		9-
Black, 20 gravity, 15 cold test.....	9	@	21
Black, 20 gravity, summer.	7	@	..
Cylinder light, filtered.....	15		
Cylinder, dark, filtered	14	@	20
Cylinder, dard, st'm refined	10	@	18
Paraffine, 23½ @ 24 gravity.	12½@		13
Paraffine, 25 gravity.....	11½@		12
Paraffine, 28 gravity.....	10½@		11
Paraffine, red, 21 @ 22 gr'ty	..	@	14½
Paraffine, red, 22½@23 gr'ty	12¾@		13

Paints and Colors.

Barytes, Prime White..... ₩ ton.	$21.00	@	$22.50
Barytes, Amer. refined...	20.00	@	....
Barytes, Amer. No. 1....	18.00	@	....
Barytes, Amer. No. 2....	16.00	@	....
Barytes, Amer., off-color.	13.00	@	15.00
Blue, Celestial..... ₩ ℔	6	@	8
Blue, Chinese.....	50	@	55
Blue, Prussian.....	25	@	40
Blue, Ultramarine.....	10	@	30
Brown, Spanish.....	½@		1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Black, American Drop....	8	@	10
Black, English Drop.....	12	@	14
Black, Frankfort, Drop...	5	@	18
Black, Lamp, common...	12	@	18
Black, Lamp, medium....	19	@	25
Black, Lamp, prime.....	27	@	33
Carmine, No. 40, in bulk.	3.10	@	..
Carmine, No. 40, in boxes or barrels.....	3.20	@	..
Carmine, No. 40, in ounce bottles.....	4.20	@	..
Chalk, in bulk.... ₩ ton.	2.50	@	2.75
Chalk, in bbls.. ₩ 100 ℔.	.30	@	.35
China Clay, English.... ₩ ton.	12.00	@	18.00
Cobalt Oxide, prep'd....	2.90	@	....
Cobalt Oxide, black.. lots 100 ℔.	2.60	@	....
Cobalt, Oxide, black..... less 100 ℔.	2.65	@	....
Green, Paris, in bulk.....	14	@	14½
Green, Paris, 170 @ 175 ℔ kegs.....	14½@		15
Green, Paris, small pack.	16	@	21
Green, Chrome, ordinary	8	@	13
Green, Chrome, pure....	23	@	25
Lead, Eng., B.B. white....	9	@	10
Lead, Amn. White, dry or in oil:			
Kegs, lots less than 1000 ℔..		@	7½
Kegs, lots 1000 ℔ to 5 tons.		@	6¾
Kegs, lots 5 tons to 12 tons..		@	6¾
Kegs, lots 12 tons and over..		@	6¼
Lead White in oil 25 ℔ tin pails, add to keg price.		@	¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....		@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2½
Lead, Red, bbls. and ½ bbls....	6¾	@	7
Lead, Red, kegs.....	6¾	@	7¼
Litharge, kegs.....	6½	@	7¼
Litharge, bbls. and ½ bbls.....	6¾	@	7

TERMS, &C.—Lead and Litharge.—On lots of 1000 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1¾
Ocher, French Washed.....	1½@		2½
Ocher, German Washed...	1½@		3
Ocher, American.....	½@		1¼
Orange Mineral, English..	9	@	9½
Orange Mineral, French....	9½@		10
Orange Mineral, German ..	8½@		9½
Orange Mineral, American.	8	@	8½
Paris White, English Cliff-stone.....	90	@	1.10
Paris White, American.....	70	@	80
Red, Indian, English.....	5½@		7
Red, Indian, American....	2	@	6
Red, Turkey.....	9	@	14
Red, Tuscan.....	9	@	11
Red, Venetian, American.. ₩ 100 ℔.	1.00	@	1.35
Red, Venetian, English....	1.25	@	1.75
Sienna, Italian, Burnt and Powd. ₩ ℔	5	@	6¼
Sienna, Ital., Burnt Lumps	1½@		3½
Sienna, Ital., Raw, Powd..	5	@	6¼
Sienna, Ital., Raw Lumps..	2	@	3½
Sienna, American, Raw....	1½@		1¾
Sienna, American, Burnt and Powdered.....	1½@		1¾
Talc, French.....	1½@		1½
Talc, American.....	1	@	1½
Terra Alba, Fr'ch. ₩ 100 ℔	72½@		80
Terra Alba, English	80	@	85
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	38	@	40
Umber, Turkey, Bnt. and Powd., ₩ ℔	3½@		4
Umber, Turkey Bnt. Ln	2½@		3
Umber, Turkey, Raw and Powdered.....	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome.....	10	@	20
Vermilion, Americ. Lead..	11½@		17
Vermilion, Quicks'er, bulk.	..	@	70
Vermilion, Quicks'er, bags.	..	@	71
Vermilion, Quicksilver, smaller pkgs.....	..	@	75
Vermilion, English Import	80	@	85
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste.....	87½@		90
Vermilion, Chinese.....	90	@	95
Whiting, Common. ₩ 100 ℔	40	@	45
Whiting, Gilders'.....	50	@	55
Zinc, American, dry.... ₩ ℔	4½@		5
Zinc, French, Red Seal....	..	@	8½
Zinc, French, Green Seal..	..	@	8¾
Zinc, French, V. M. X....	..	@	7
Zinc, Antwerp, Red Seal...	..	@	7¾
Zinc, Antwerp, Green Seal	..	@	8¼
Zinc, German, L. Z. O....	..	@	6¾
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10¾@		11¼
lots less than 1 ton	11	@	11¾
Zinc, V. M. in Poppy Oil, Red Seal, ...	..	@	..
lots of 1 ton and over....	10	@	10¼
Lots of less than 1 ton....	10¼@		10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 % ; 25 bbls, 2 % , 50 bbls, 3 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese..... ₩ ℔	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramar.ine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	13
Sienna, Burnt.....	7	@	13
Umber Raw.....	7	@	10
Umber, Burnt	7	@	10

Spirits Turpentine.

In regular bbls.....	39	@	39¼
In machine bbls.....	39¾@		40

Glue.

Low Grade..... ₩ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	..
English.....	10	@	1
Irish.....	12	@	1

CURRENT METAL PRICES.

FEBRUARY 4, 1891.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron: ¼ to 2 in. round and square.. 1 to 6 in. x ⅝ to 1 in.....	₩ lb 2.00 @ 2.10¢
Refined Iron: ¼ to 2 in. round and square.. 1 to 4 in. x ⅝ to 1½ in..... 4½ to 6 in. x ⅝ to 1 in.....	₩ lb 2.10 @ 2.30¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.30 @ 2.50¢
Rods—⅝ and 11-16 round and sq..	₩ lb 2.20 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12.....	₩ lb 2.40 @ 2.60¢
"Burden Best" Iron, base price..	₩ lb..... 3.00¢
Burden's "H. B. & S." Iron, base price.....	₩ lb..... 2.80¢
"Ulster".....	₩ lb..... 3.00¢
Norway Bars	4.00¢
Norway Shapes	5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16.....	₩ lb 3.00	@ 3.00¢	3.35	@ .....¢
17 to 20.....	₩ lb 3.15	@ 3.25¢	3.35	@ 3.75 ¢
21 to 24.....	₩ lb 3.35	@ 3.35¢	3.60	@ .....¢
25 and 26....	₩ lb 3.35	@	3.60	@ .....¢
27.....	₩ lb 3.50	@ 3.62½¢	3.85	@ .....¢
28.....	₩ lb 3.65	@ ....¢	4.10	@ .....¢
	B. B.			2d qual.
Galv'd, 14 to 20,	₩ lb, 4.75	@ ...	4.60	@ .....¢
Galv'd, 21 to 24,	₩ lb, 5.12	@ ...	5.00	@ .....¢
Galv'd, 25 to 26,	₩ lb, 5.50	@ ...	5.35	@ .....¢
Galv'd, 27.....	₩ lb, 5 90	@ ...	5.70	@ .....¢
Galv'd, 28.....	₩ lb, 6.25	@ ..	6.10	@ . ..¢
Patent Planished.....	₩ lb	A 10¢		B, 9¢
Russia.....	₩ lb	10½¢ @ 11¢		
American Cold Rolled B. B.....	₩ lb	5¢ @ 7¢		
Craig Polished Sheet Steel.....	₩ lb,	8½¢		

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 12 ¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.....	₩ lb 9 ¢
3d quality.....	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d quality.....	₩ lb 14 ¢
3d quality.....	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" " "Titanic".....	₩ lb 20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	23 ¢
Straits, Pigs.....	23½¢
Straits in Bars	24 ¢

Tin Plates.

	Charcoal Plates.—Bright.		Per box.
Melyn Grade.....	IC, 10 x 14..	@	$6.50
" "	IC, 12 x 12..	@	6.75
" "	IC, 14 x 20..	@	6.50
" "	IC, 20 x 28..	@	13.25
" "	IX, 10 x 14.. ...	@	8.00
" "	IX, 12 x 12..	@	8 25
" "	IX, 14 x 20..	@	8 00
" "	IX, 20 x 28..	@	16 00
" "	DC, 12½ x 17.. ...	@	6 00
" "	DX, 12½ x 17..	@	7.50
Calland Grade.....	IC, 10 x 14..	@	6.50
" "	IC, 12 x 12..	@	6.75
" "	IC, 14 x 20..	@	6.40
" "	IX, 10 x 14..	@	7.65
" "	IX, 12 x 12..	@	7.90
" "	IX 14 x 20.	@	7.65
Allaway Grade.....	IC, 10 x 14..	@	6.00
" "	IC, 12 x 12..	@	6.15
" "	IC, 14 x 20..	@	6.00
" "	IC, 20 x 28..	@	11.80
" "	IX, 10 x 14..	@	7.17
" "	IX, 12 x 12..	@	7.30
" "	IX, 14 x 20..	@	7.15
" "	IX, 20 x 28..	@	14.25
" "	DC, 12½ x 17.. ...	@	5.65
" "	DX, 12½ x 17.. 6.00	@	6.65

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	@	$5.60
10 x 20..	@	7.75
20 x 28.. ...	@	11.25
IX, 10 x 14, 14 x 20..	@	6.50
BV Grade.—IC, 10 x 14, 14 x 20.. ...	@	5.60

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20..	@	$5.40
20 x 28.	@	10.70
IX, 14 x 20.....	@	6.10
20 x 28.....	@	12.10
Antecarne Grade.—IC, 14 x 20...	@	5.10
20 x 28...	@	10.35
IX, 14 x 20....	@	6.10
20 x 28..	@	12.10

Tin Boiler Plates.

IXX, 14 x 26.....112 sheets.....	@ $13.50
IXX, 14 x 28.....112 sheets....	@ 13.75
IXX, 14 x 31... ....112 sheets	@ 15.25

Copper.

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot.

Lake...	@ 15¾¢
Baltimore Grade.....	@ 14 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	24	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	...	...	...	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.
Per pound.....	$0.27	0.29	0.31	0.35

Bolt Copper, ⅝ inch diameter and over, per pound..... 22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	26¢
12 ounce and up to 14 ounce to square foot.....	27¢
10 ounce and up to 12 ounce.....	29¢
Lighter than 10 ounce.....	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 30 x 60 each.....	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48, 14 x 52, 14 x 56, 14 x 60 in.

14 and 16 oz. and heavier..33¢. By the case..	32¢ ₩ lb
12 oz. and lighter.....33¢. By the case...	34¢ ₩ lb
24 x 48 and 30 x 60.	
14 and 16 oz. and heavier..36¢. 12 oz.....	39¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1⅛
8-14	6-12	37	33	30	29	28	27	24
15	13	38	35	31	30	29	28	25
16	14	39	34	32	31	30	29	25
17	15	40	35	33	30	31	30	26
18	16	42	36	34	32	31	30	27
19	17	43	37	35	34	33	32	29
20	18-19	44	39	37	36	35	34	31
21	20	46	41	39	38	37	36	34
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	39
24	23	53	46	44	43	41	40	41
25	24	56	49	46	45	44	43	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch.....	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch.....	$1.00
Plain, ⅛ inch.....	1.50
Fancy Tubing, Brass, to No. 20, inclusive.....	43¢ ₩ lb
bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list.....	25 @ ... %

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2 10	in. 10 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24
To No. 20, inclusive...	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24.	.22	.23	.24	.26	.28	30	.32	.34
Nos. 25 and 26.....	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28.....	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24 26	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40
To No. 20, inclusive...	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24.	.37	.40	.43	.47	.51	.56	.61	.68
Nos. 25 and 26.....	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28.....	.39	.42	.45	.49	.53	.58	.65	.75

Brass and Copper Wire.

Old English guage standard.	Com. high brass. Per lb.	Low brass. Per lb.	Gildi'g br'se & copper Per lb.
All Nos. to No. 16, inclusive....	$0.22	$0 26	$0.30
No. 17 and No. 18.....	.23	.27	.31
No. 19 " " 20.....	.24	.28	.32
No. 21.....	.25	.29	.33
No. 22.....	.26	.30	.34
No. 23.....	.28	.32	.36
No. 24.....	.30	.34	.38
No. 25.....	.32	.36	.40
No. 26.....	.35	.39	.43
No. 27.....	.38	.42	.46
No. 28.....	.42	.46	.51
No. 29.....	.45	.49	.54
No. 30.....	.48	.52	.62
No. 31.....	.51	.55	.67
No. 32.....	.55	.59	.73
No. 33.....	.59	.63	.82
No. 34.....	.64	.68	.95
No. 35.....	.70	.74	1.30
No. 36.....	.76	.80	1.50
No. 37.....	1.00	1.04	1.70
No. 38.....	1.30	1.34	2.00
No. 39.....	2.00	2.00	3.25
No. 40.....	2.60	2.60	5.75

Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs.

	Per lb.		Per lb.
No. 5.....	49¢	No. 11.....	56¢
No. 6.....	49¢	No. 12.....	58¢
No. 7.....	49¢	No. 13.....	60¢
No. 8.....	50¢	No. 14.....	65¢
No. 9	52¢	No. 15.....	70¢
No. 10.....	54¢		

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6½ @ 6¾¢
"Bertha"	8¼¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks..... ..	7¼¢
Per lb	7½¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American	5 ¢ @ 5¼¢
Bar.....	5¼¢ @ 5½¢
Pipe, subject to trade discount....	7½ %
Tin-Lined Pipe, subject to trade discount....	15¢
Block Tin Pipes, subject to trade discount.....	40 %
Sheet, subject to trade discount.....	8¢

Solder.

½ @ ½ (Guaranteed)...	16¢
No. 1.	13¢
Extra Wiping.....	11½¢ @ 13¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson.....	₩ lb 19½¢
Hallett's.	" 18 ¢

ALUMINUM.

Prices in Ingots.

$2.00 ₩ lb in lots of 1000 lb and over.
$2.25 ₩ lb in lots of 500 lb and over
$2.50 ₩ lb in lots of 100 lb and over.

For prices on Rolled Sheets, Tubing, Casting and Wire, see *The Iron Age*, December 11, 1890, page 1170.

Old Metals.

(Prices Paid in New York.)

Heavy Copper.....	₩ lb 12 ¢
Light Copper...	₩ lb 11 ¢
Heavy Brass.....	₩ lb 10 ¢
Light Brass.....	₩ lb 8 ¢
Lead.....	₩ lb 4 ¢
Tea Lead.....	₩ lb 3½¢
Zinc.....	₩ lb 3 ¢
No. 1 Pewter.....	₩ lb 16 ¢
No. 2 Pewter	₩ lb 8 ¢
Wrought Scrap Iron.....	₩ gross ton $19.00
Heavy Cast Scrap.....	₩ gross ton 12.00
Stove Plate Scrap.....	₩ gross ton 8.00
Burnt Iron....	₩ gross ton 6.00